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PERSONAL COMPUTING

A Hayden Publication

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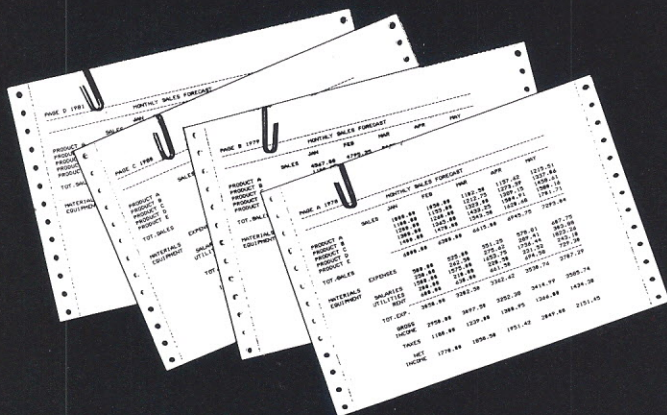
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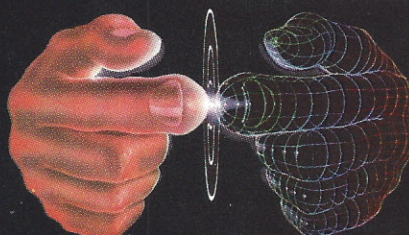
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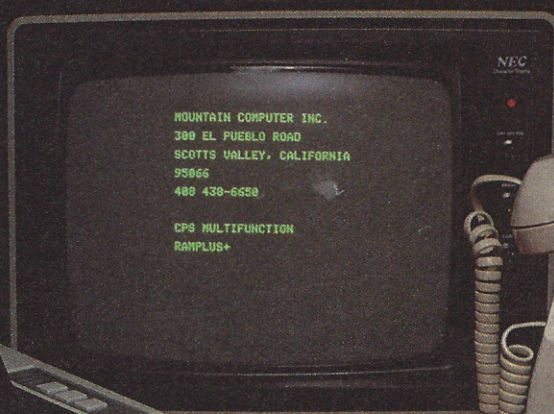
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CIRCLE 2

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March 1982
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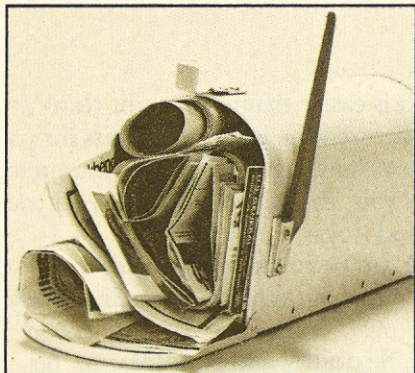


COVER PHOTO BY STEVE EISENBERG

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BEHIND THE COVER

Ever feel like you're not juggling your time as efficiently as you could be? Or that your time will run out before you finish what needs finishing? This need not be the case—not if you let your personal computer become your own personal time manager.



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45 GETTING YOUR JUST DUE WITH ACCOUNTS RECEIVABLE SOFTWARE

BY JASON BIRMINGHAM AND BETSY GILBERT Just as a bank scrutinizes a company's receivables to get a full business picture, businessmen are scrutinizing their own receivables—via personal computers—so that they can more accurately plan their work and work their plan.

50 NET GREATER PROFITS WITH SUCCESSFUL SALES MANAGEMENT

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BY LEON STARR It's possible that the root of technophobia lies in the word "programming." But although programming is a *different* experience, it's not necessarily a difficult one. In this Part I of a three-part series, *Personal Computing* introduces you to programming in a reader-friendly way.

72 WORD PROCESSING: THE A TO Z OF SOFTWARE

BY ROBERT PERRY To put it in writing no longer means quill pen and ink—nor Flair, nor Bic. We're talking about word-processing software. Find out what's available and what's right for you.

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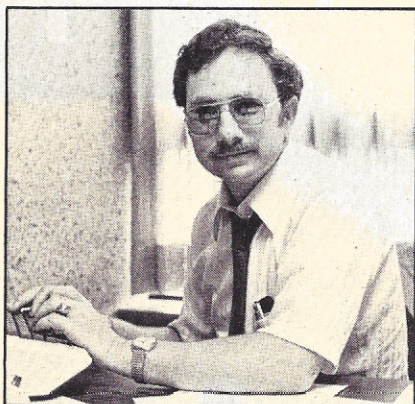
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CIRCLE 3

EDITORIAL

Times are a-changin'



Some philosophers point out that the only real constant is change. *Personal Computing* magazine is no exception. Careful readers have

noted, I'm sure, that there have been vast changes in our publication over the past eight or nine months. We're not at all the same this month as we were last March. And next month, we'll remove all doubt that we've changed—we're going to look radically different.

You'll be shocked when you see our new look. We were, so we know you'll be as well. Like us, you may be happy, or you may be slightly uncomfortable, or the change may displease you at first. But whatever your other reactions, you will be shocked.

We know this will happen yet we're still proceeding with our new look, because we're sure of two things. First, you will be better able to see *Personal Computing* for what it is—the businesslike magazine of people and computers. The way we'll look clearly represents our personality. Second, our new format and appearance will make it easier for you to

get the information you need about personal computing. At the same time, it will make *Personal Computing*, more than ever, a companion with whom you can relax and learn more about how people have succeeded, and will continue to succeed, through computing.

See, we know who you are. We know what you want. You need solutions to problems, and you want the answer to the question, "What else can I do with my personal computer?" Our new format will make it even easier for us to present, and for you to find, those solutions and answers.

So don't be put off when you see *Personal Computing* next month. As the French say, "Plus ça change, plus c'est la même chose,"—the more things change, the more they remain the same. You wouldn't stop speaking to a friend if he shaved off his beard. Nor would you avoid a person who dyed her hair. Once you get used to the change, you realize that they remain the same people—they just improved themselves.

So it is with us. We'll change our appearance, but we won't *really* change. Except we'll be even better.

David Sahel



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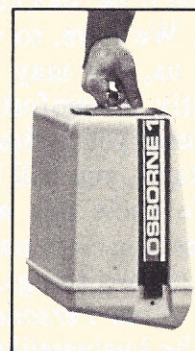
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Astronomy input

Dear Editor:

There are some incorrect statements in the Astronomy article by Harold Miller, which appeared in the January 1982 issue of *Personal Computing*.

Mr. Miller states that the declination of a star is the star's angular distance north and south of the ecliptic. While there is a coordinate system which uses the plane of the ecliptic as a reference, it is used primarily for the locations of objects within the solar system. (Only the Moon, Pluto and some comets and asteroids have orbits which are inclined more than seven degrees from this plane.) Rarely are the positions of stars and other objects outside our solar system cataloged according to their ecliptic latitude and ecliptic longitude. Instead, a much more natural coordinate system is used.

The earth's equator is projected onto the celestial sphere, and this great circle is called the celestial equator. The points on the celestial sphere, at which the projections of the earth's axis of rotation intersect, are referred to as the north and south celestial poles. Declination is measured north (+) and south (-) from the celestial equator.

Right ascension is measured eastward from the vernal equinox, one of the two points where the ecliptic intersects the celestial equator. Celestial coordinates are much more practical to use at the telescope, since the ecliptic is inclined to the equator by nearly $23\frac{1}{2}$ degrees.

There are three instances where mathematical formulae are incorrect in the text of the article. First, in order to convert right ascension from hours-minutes-seconds notation into degrees of arc, the notation must be converted into decimal hours, and then multiplied by 15:

$RA_{deg} = 15 \times RA_{decimal} = 15 (RA_{hour} + RA_{min}/60 + RA_{sec}/3600)$

Mr. Miller does appear to have ap-

plied this transformation correctly to the stars' RA coordinates, before coding them into DATA statements.

The other two errors appear in the formulae that convert from cartesian to spherical coordinates. They should read:

$R = \sqrt{X^2 + Y^2 + Z^2}$ and
 $T = \arctan(Z/\sqrt{X^2 + Y^2})$

These equations appear to be implemented correctly. Also, there are 3.262 light-years in one parsec.

Stephen M. Smith
Cleveland, OH

Editor's Note: Thanks for the information. We got the program to do everything the author said it could; we couldn't make it fail. We're not astronomers, so we can't tell for sure if all the manipulations yield correct results.

Good job

Dear Editor:

As a new *Personal Computing* subscriber, I'd like to extend my congratulations on a job well done. Your magazine is orderly, informative and professional—unlike some which vie for the same readership.

Many thanks.

Charles L. Gravel
Adams, MA

In response

Dear Editor:

I have just finished reading the January 1982 issue of *Personal Computing* and I wish to respond to Martin G. Chaney's letter in which he requested information on organizations knowledgeable in the area of instructional computing.

I am the current national chairperson for the Elementary, Secondary and Junior College Special Interest Group of A.D.C.I.S. (Association for the Development of Computer Based Instruction Systems). A.D.C.I.S. is an international non-profit association with a worldwide membership. Our members represent elementary and secondary schools,

junior colleges, colleges and universities, vocational and specialized schools, business and industrial training personnel and military and government training agencies.

A.D.C.I.S. membership represents a full cross-section of educational and training professions including teachers, administrators, managers, courseware designers, hardware engineers, students, researchers, evaluators and others. Members interests range from the most basic concepts of computer literacy to the most advanced concept of machine interfacing, but perhaps the strongest interest lies in the exchange of information. Our group welcomes everyone, for there is no one from whom we cannot learn.

I invite any interested readers to contact our executive secretary, Mr. Gordon Hayes, at the International Headquarters which is based in the Computer Center at the Western Washington University in Bellingham, Wash. 98225; (206) 676-2860.

Daryl R. VanAlstyne, Chairperson
A.D.C.I.S. - EL/SEC/JC
BOCES Regional Computing Center
Spencerport, NY 14559

Seeking an antidote

Dear Editor:

I have developed hypercomputeremia, and the "bug" is growing wildly in my blood. Each issue of *Personal Computing* aggravates the condition. I become febrile and tachycardic while devouring each article. Fortunately, I have learned to live with this condition and the prognosis is excellent.

I don't think you have an antidote for my condition, but you might be able to help me with a more realistic problem. I recently acquired an HP-85 with dual disk drives as part of an on-line laboratory instrument, and I plan to write (attempt to) off-line programs in BASIC. In general,

these programs will handle patient demographic and data files in interpretive diagnostic and collation programs.

As a novice programmer, who doesn't want to reinvent the wheel, I am seeking a reference text(s) detailing the logic, architecture and actual subroutines for handling files, data, collation, etc. Can you suggest anything?

Keep up the good work.

Thomas S. Herman, Ph.D.
Savannah, GA

Taxing points

Dear Editor:

TaxPro, a federal and state income-tax system for the professional accountant, lawyer or tax preparer, was not mentioned in Robert L. Perry's otherwise fine article, "Tax preparation software: how to ease the IRS blues," in the December 1982 issue of *Personal Computing*.

Among other advantages, the system allows up to three separate Schedule Cs and accomodates up to three rental properties. All lettered schedules and 31 numbered schedules are prepared more than any program mentioned in the article. Among the less common forms produced are: 1116, 1310, 2210F, 2440, 2441, 4136, 4137, 4255, 4874, 4952 and 5884.

State returns include New York, New Jersey, California, Ohio, Connecticut, Pennsylvania, Maryland, Oregon and Louisiana. Other state returns will be available where there is sufficient interest. In most cases, the state non-resident returns are included.

In addition to the printing alternatives you mentioned in the article, we support plain paper or government stock printing with or without a sprocketed carrier sheet for Forms 1310, 4952 and others for which commercial substitutes are not readily available.

The system is written for any 56k Z80 computer employing the Micropolis DOS. The basic federal system is licensed for users for \$2000. New York and California programs are \$500 and other states are \$300. An optional overlay program, available for \$200, allows the user to prepare subsequent year pro-formas and to produce longer lists for the current-year return.

Martin C. Rothstein
Taxpro

21 E. 40th St., Room 2104
New York, NY 10016
(212) 683-5310

Editor's note: We have been in contact with the folks at Hewlett-Packard regarding your problem. They suggest you consult your owner's manual for example programs and descriptions, or go to a qualified HP dealer in your area for help. They also suggested their BASIC Training Pack which sells for \$95 as a further reference. If you need any further information contact Hewlett-Packard directly at 1501 Page Mill Rd., Palo Alto, CA 94304; (415) 857-3752.

Editor's note: Personal Computing has received a great deal of response to Betsy Gilbert's article, "Up your speed and efficiency with computerized inventory control," on page 18 of the January 1982 issue.

Unfortunately, an error appeared in reference to SofTech International, the creators of STOCK FILE. The company name is actually Solidus, and interested readers can contact the firm at Suite 6, 144 W. 15th St., North Vancouver, British Columbia, Canada V7M 1R5; (604) 984-0477.

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CIRCLE 47

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Computer graphics contest for young people

In a contest designed to encourage young people to explore the graphics capabilities of their computers, the Young People's LOGO Association (YPLA) of Richardson, Texas (see *Personal Computing*, Dec. 1981, page 67) is offering an Atari 400 and a TI 99/4 computer for the most creative computer graphics programs developed by participants 18 years old and younger. Programs submitted will be judged on originality and creativity, and will be balanced against the capabilities of the language and the system used, as well as the age and experience of the programmer.

Young people can submit programs through June 30 as individuals or as a group, but only one award will be granted to any single winning entry. All programs submitted become public domain software and will be included in the YPLA Software Exchange Library.

For additional information about the "Earn a Computer" contest, contact the Young People's LOGO Association, 1208 Hillsdale Dr., Richardson, TX 75081; (214) 783-7548.

Three Japanese companies agree on floppy-disk format

Three of the larger Japanese high-technology firms, Matsushita Electric Industrial Co., Hitachi, and Hitachi Maxell, have agreed on a standard format for the planned "Compact Floppy Disk" now in research and development.

The new 3-inch floppy will be compatible with, and have the same recording capacity as the 5-inch "Mini Floppy Disk" currently used as external memory for many personal computers. The three companies decided to standardize the compact disk while it is still in development to ensure that it fits easily into the computer and disk-drive marketplace when it is finally released. They plan to propose the format to disk and hardware manufacturers in hopes that it is accepted for industry-wide specifications.

The format includes standardization of rotation speed, data-transfer rate and recording capacity per track, all of which will allow current floppy-disk controllers—the mechanisms that activate disk-drive systems—to be compatible with the compact floppy disks.

Tandy announces new multiuser terminal and computer

Tandy Corporation has branched into a new direction with the introduction of two products aimed at the multiuser environment. The TRS-80 Microcomputer Model 16 is a multiuser computer that can be used by as many as three people at a time. The computer is said to be compatible with the older Model II. At the same time, the company says it has developed a terminal, called the DT-1 advanced video-data terminal, that will serve as a work station for the Model 16.

The terminal emulates four of the more popular models currently on the market—Televideo 910, Lear Siegler ADM5, ADDS 25, and Hazeltine 1410—and is targeted for remote communications, direct-connect modems and the Model 16. Specifications include 70 keys, an 80 character by 24-line video display, four types of cursors, and keyboard-selectable configurations that are maintained in double EPROM memory, independent of power.

One Radio Shack spokesman says that the development of the TRS-80 Model 16, which will need additional terminals in its multiuser environment, was a persuasive force behind the development of the DT-1.

The computer and the terminal will be available in the second quarter of 1982.

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Apples help the critically ill

"Disenchanted" is how Peter Groves, a partner in Groves Nurses Registry of San Francisco, describes himself after a six-month investigation of computer systems. It took an Apple personal computer to lure him back into the garden of data-processing delights.

His tale of woe began two years ago when he began looking at computer systems to help manage the exacting business of providing more than 25 San Francisco Bay Area hospitals and medical-care centers with skilled relief nurses.

In late 1979 registry co-owners, Groves and George Sahlin, realized that the sheer volume of information needed to operate a responsive business had become almost impossible to control by manual methods.

"We were very enthusiastic," Groves says, "when we entered into talks with computer manufacturers. We looked at many systems in use by client hospitals and talked with programmers and suppliers of hospital computer systems.

"After six months, we became disenchanted with the computer world in general. Hardware costs were incredible. Programming wasn't only expensive, but cost overruns were an obvious risk. Programming responsibilities would have to be given to people familiar with the suppliers' hardware. Delivery of the hardware, in one case, was two years away, and there were arguments over who would own the software."

So Groves Nurses Registry returned to pencil and paper, a process that threatened to suffocate the staff and restrict the growth of the business. The night staff in the round-the-clock business spent virtually all of its time poring over lists of client requests and nursing backgrounds, checking and re-checking the details to assure that a good match was made and that payroll records were correct.

"We couldn't make errors in filing client requests or in paying our people. We had the choice of limiting our business to a paper-and-pencil level or finding some way to efficiently manage the complex nature of nurse placement where up to a dozen variables have to be considered," Groves says.

So on the advice of a computer consultant for one of the registry's client hospitals, Groves agreed to take a look at an Apple computer. "The price was so low that I couldn't believe it could meet our heavy

work load."

With the consultant's assurance that a program could be tailored to the registry's requirements with minimal cost and chaos, Groves Nurses Registry became the owner of three Apple computers, each sharing a common data base. The registry's office staff was quickly trained in the use of the new computer system. Today, it spends the majority of its time in client service rather than in paper juggling.

The computer system includes three Apple personal computers sharing information stored on a 10-megabyte hard disk. It also has a clock/calendar capability to record the time and date of each transaction. A special Pascal language program was developed by Groves to meet the needs of the nurses' registry industry, and the program is being offered by Groves to other nurses registries outside its service area.

"This is a highly competitive business," Groves states, "and the company that can provide the best client service gets the business."

In its six years of operation, Groves Nurses Registry has evolved into the largest independent placement agency of staff relief nurses in acute-care hospitals in the San Francisco Bay area. Groves attributes this success to his company's ability to respond quickly to even the most specialized need for nursing services.

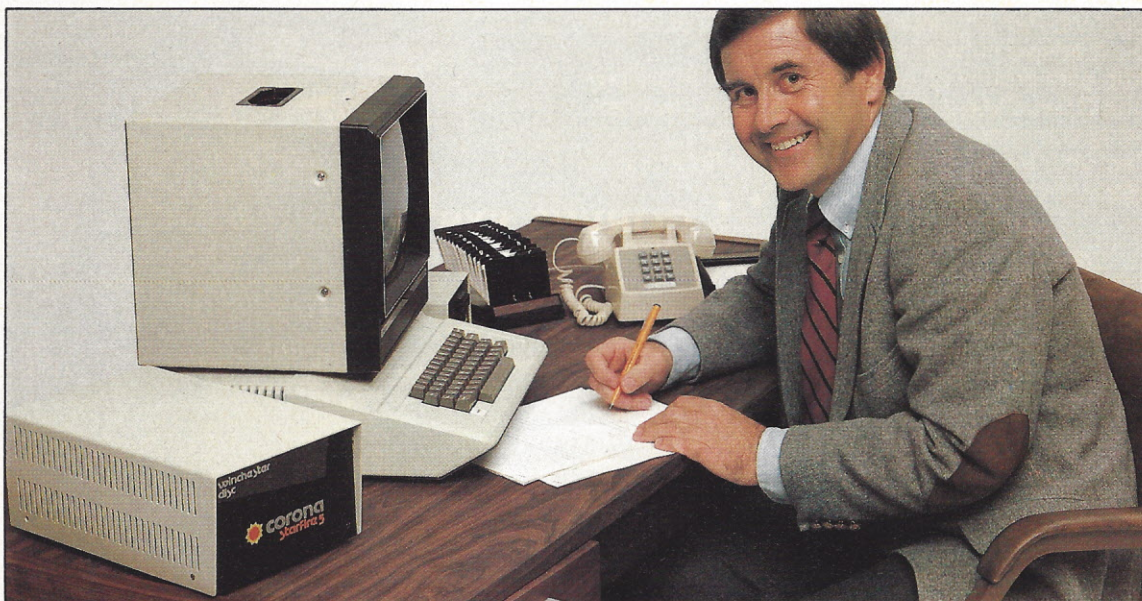
Client hospitals will call Groves Nurses Registry for relief nurses in any of the 39 specialties the registry handles. Hospitals and other acute-care centers maintain permanent staffing at minimal levels and depend on temporary personnel to handle the peak loads. But staffing complications are magnified because nurses—and their skills—are not interchangeable. Special skills and training are needed, particularly in critical-care areas.

"A request," Groves says, "may be received for a nurse with extensive coronary training to provide one-to-one nursing care for an acutely ill patient. We must find that person among our employees almost instantly and arrange that she arrives at the hospital within an hour to relieve a nurse going off duty. As our employees are attracted to relief nursing primarily because of scheduling flexibility—in which they can change their availability from day to day—a mind-boggling mathematical equation results for placing one person."

Today, using the Apples, the Groves staff coordinator types out client's requirements on the computer's typewriter-like keyboard. Immediately, a list of all Groves employees with the required skills appears on the screen. The coordinator scans the list



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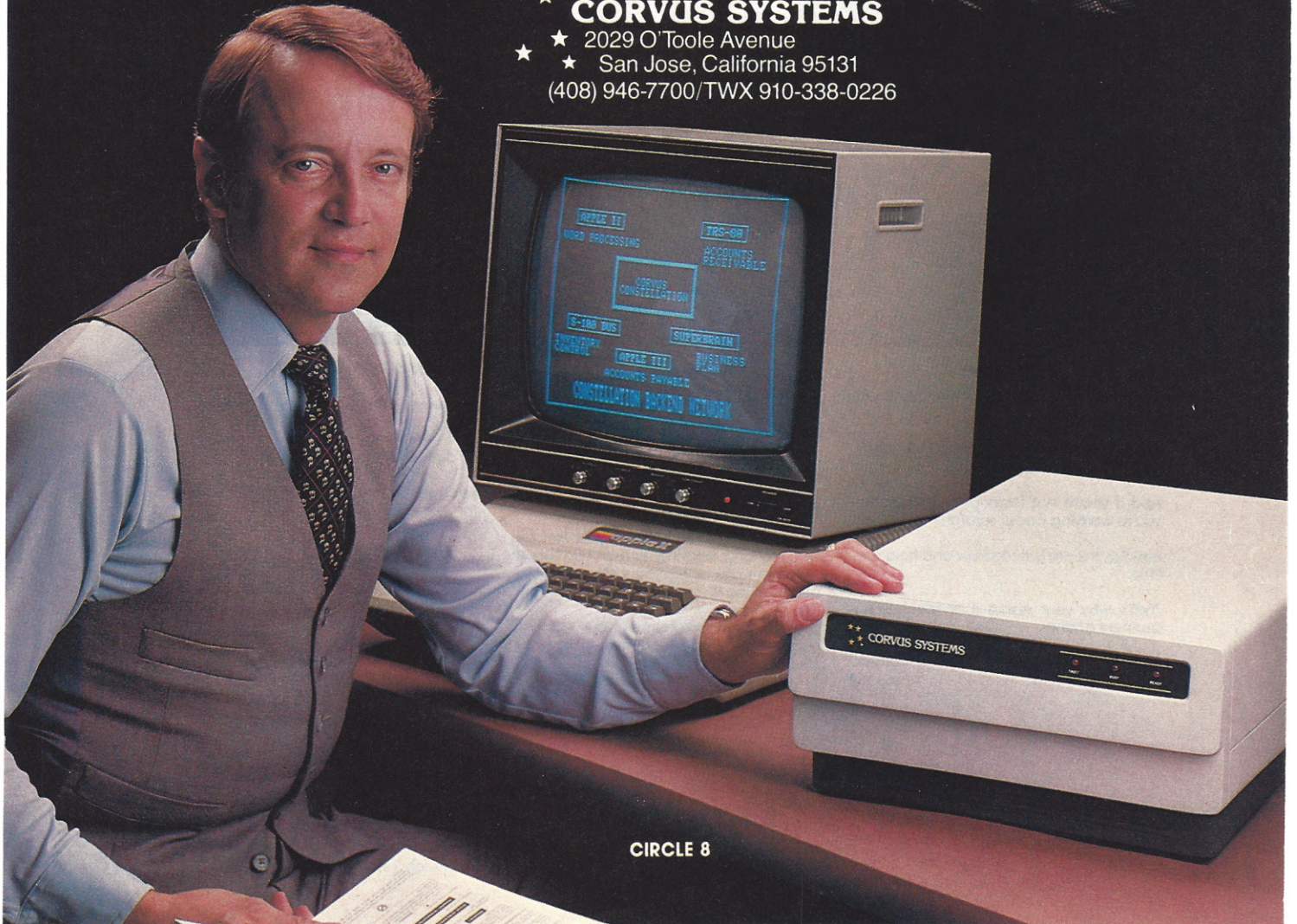
The Corvus Omninet links up to 64 computers in a state-of-the-art multi-processor network. It provides shared mass storage, pipes for inter-computer communication, and system spooling for sharing of peripherals such as printers. Performance far exceeds that of larger and more expensive networks.

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and instructs the computer to dial the person who best meets the hospital's requirements. He then confirms that the nurse is able to report for the next shift at the client hospital or care facility. In a single action the coordinator has found, confirmed placement, and activated payroll records for a nurse with special skills.

It often takes less than a minute to search the records of more than 1500 nurses employed by the registry to find the people with the needed skills.

Groves employs a medical director whose full-time responsibility is to hire people and update experience and education records, categorizing their levels of experience in specific care. This update is done quickly by getting each person's work and education history from the computer and adding training or experience which qualified the person for a new skill level. Until this spring, the registry staff handled this monumental record-keeping task with paper and pencil.

"Our night employees were virtual drones," Groves says. "They did the tedious checks and double-checks to assure that personnel records were up to date, that the availability of all active employees was accurate, and that payroll records were correct. Today, our night employees devote most of their time to client service. They contact the hospitals they serve to anticipate future needs and to assure that all current requirements have been met."

The reams of paper that used to result from a day's activity have been replaced by a small magnetic disk with the capacity to store information on all activity in the office and, more importantly, to make sure that information is immediately accessible for review and action.

In one week, the registry places up to 850 registered nurses, licensed vocational nurses and hospital attendants on assignments ranging in length from a single shift to several weeks.

"Time and accuracy are vital in this business—sometimes lifesaving," Groves says. "Hospitals attempt to give us advance notice, but it's often only hours before a nursing specialist must be on duty that the hospital knows its full staffing requirements for that shift. The admission of critically ill patients can't be postponed until the appropriate nursing staff is available."

Personal computer for birth control

A bedside personal computer, about the size of a pocket calculator, is expected to increase the use

and accuracy of the birth-control method known as "natural family planning" when it is publicly marketed during the next few years.

The computer, which is about to be tested at clinics in Florida as well as in World Health Organization (WHO) research centers worldwide, charts an extremely accurate, measurement-sensitive record of a woman's temperature. It then signals with a green light when she is infertile and can proceed with unprotected intercourse.

According to project researchers, this electronic body monitor is considered a major leap forward in birth control, as well as a simplification of natural family-planning methods, which now depend on manual plotting of temperature shifts and frequent inspections of the amount and consistency of a woman's cervical mucus. Natural family planning—which has been endorsed by the Roman Catholic Church and is favored by women who object to artificial birth-control methods—avoids pills, spermicides or barriers such as the diaphragm or intra-uterine device.

Instead, the computer is programmed to adjust itself for natural fluctuations in body temperature and for out-of-synch menstrual cycles, but it cannot differentiate between fertile periods and naturally induced internal heat from a viral fever, for example.

More than a year of joint studies sponsored by the WHO and conducted at the University of Florida's College of Medicine at Gainesville and at the Clinical Research Center in Harrow, England, went into the development of the computerized birth-control method. When it is ready to be mass produced, the computer will cost about \$40.

Home tax software: what's available

As April 15 rapidly approaches, the flurry of activity around the personal computer consists of curing that annual headache—finishing the 1981 tax return.

The December 1981 issue of *Personal Computing* detailed the packages available for tax preparation by professionals. This article takes another tack to alleviate the tax burden by using your personal computer at home. Some of the packages discussed in the December roundup are again

mentioned because they also pertain to home use.

Personal Computing doesn't encourage or discourage you to do your own taxes, and we cannot guarantee the proper operation of the products mentioned herein. But if you do decide to do your own taxes, there are several products that will help you do just that.

Aardvark Software
783 N. Water St.
Milwaukee, WI 53202
(414) 289-9988

Personal Tax Plan

This home tax-planning software package can be used throughout the year for tax planning and preparation. The program automatically computes the federal tax liability for 1981 through 1984 with appropriate rate tables, tax tables and rate schedules. It automatically computes income averaging, maximum tax on earned income, add-on minimum tax, alternative minimum tax, the capital gains deduction, the 50 percent charitable contribution, medical expenses and the capital loss limitations.

The program prints a summary output which is similar to an IRS 1040 form, but it does not print directly on the 1040. This form gives a listing of wages, capital gains or losses, partnership income and other income. It also lists totals for medical expenses, interest expense, general contributions, casualties losses and miscellaneous deductions.

In addition to these features, the program displays taxable income, excess itemized deductions, exemptions and credits and payments. Finally, the program gives your balance due figure, your expected refund and your tax bracket.

For 1982 and thereafter the program will also compute the two-earner married-couple deduction. Users who claim this deduction can immediately see the tax effects as well as changes in income and expense items. They can also print forms which list only entered data. Tax results can be displayed on the screen or can be printed out in a letter format which is suitable for permanent records. Tax plans can be saved on diskette for changes or review.

The Personal Tax Plan program runs on an Apple II, an Apple II Plus or under CP/M. It requires a minimum of 48k and one or two disk drives. A printer is optional. The price of the software is \$130.

Howard Software Services
6713 Vista Del Mar
La Jolla, CA 92037
(714) 454-5079

Tax Preparer

This software package calculates taxes and prints them out on preprinted IRS 1040 forms. The program also allows storage of tax information year to year and transfers new updated schedules to disk at

the end of each tax year.

The program comes with a complete set of 22 forms and schedules including minimum and maximum taxes, income averaging, capital gains, depreciation and rentals.

The structure of the program is based on the 1040. The user must fill in the spaces on the form just as if he were doing it by hand. The computer does all of the calculations. An auto-updating feature allows changes in one form to be reflected in all forms for error correction.

Howard Software also offers separately priced add-on packages for selected states' taxes using the federal tax calculations as a starting point, eliminating the need to re-enter data.

Tax Preparer runs on the Apple II, Apple II Plus and Apple III with one or two disk drives and 48k. The price for the 1981 edition is \$99.

JJR Data
P.O. Box 74
Middle Village, NY 11379
(516) 643-1931

Tax Preparation

Tax Preparation is one of the least expensive packages available for home tax preparation. The program is available on disk or cassette for the TRS-80, Apple and NorthStar personal computers. The price of the software is \$15.

The package is capable of completing IRS Form 1040 as well as Schedules A, B and C. It can also print on these forms if a printer is available. The software handles income averaging and saves all tax information on disk for future use.

Micromatic Programming Co.
P.O. Box 158
Georgetown, CT 06829
(203) 324-3009

Tax Saver I, Tax Saver II

The Tax Saver programs are self-prompting and include many help features. For instance, if a user doesn't know whether or not he can claim someone as a dependent, the program goes through all of the IRS dependency tests with him. It also helps determine filing status.

There are currently two versions of the program—Tax Saver I, which costs \$79.95 and Tax Saver II, which costs \$119.95. The difference between the versions is the number of computations and forms each can handle.

Tax Saver I completes Schedule A, which includes itemized deductions; Schedule B, which includes interest and dividends; and also completes tax calculations, tables and rates. The program includes tax-saving methods such as income averaging and maximum and alternative tax.

continued on page 118



The Manager Series* from Microsoft™ turns a personal computer into an executive toolbox.

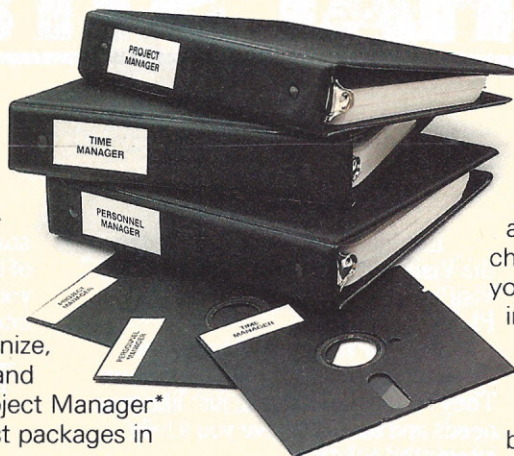
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And, when you've learned to use one in the Series, you've virtually learned them all.

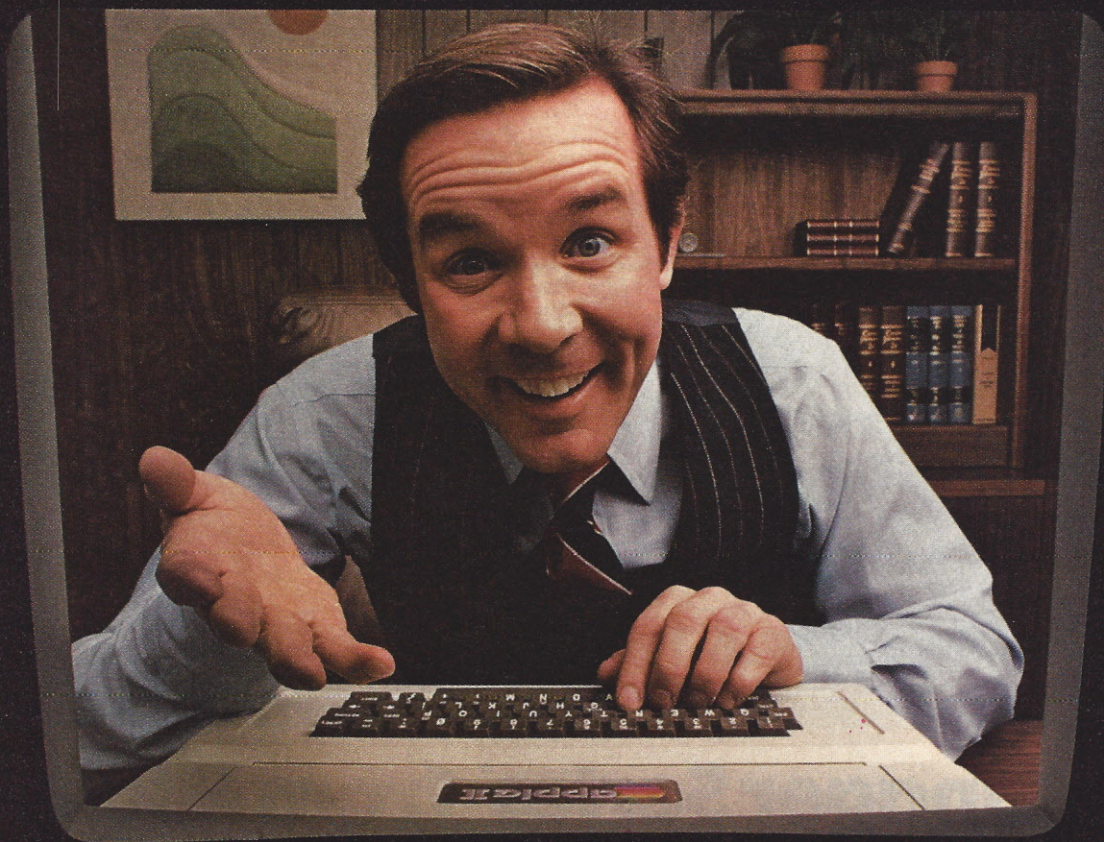
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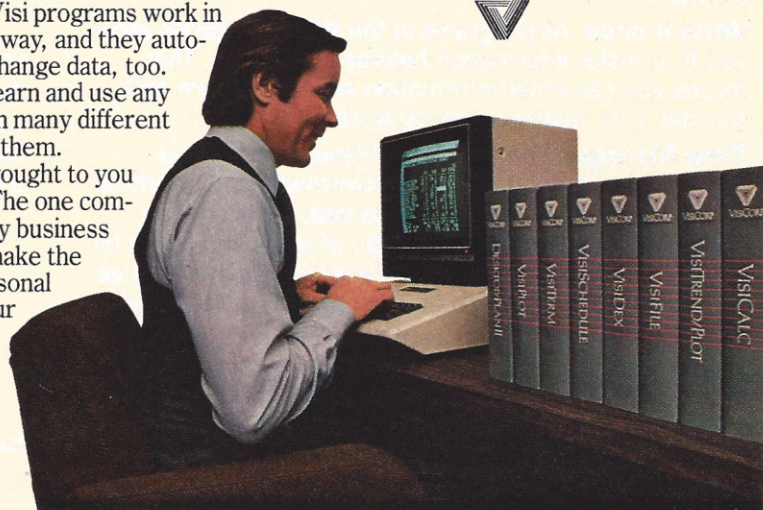
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INTERVIEW

A PERSONAL COMPUTING

Interview with Bob Harp

Bob Harp, the subject of this month's Personal Computing interview, is something of a self-made man. From an academic background, he has become the Chairman of the board and the engineering vice president of Vector Graphic, a very successful computer company, which today has about 400 employees and is targeting sales at more than \$40 million this fiscal year. In fact, the company just made its initial stock offering, and this is the first interview that Harp has given since the company came out of its SEC-mandated "quiet period."

In the conversation, Harp talks about personal computing—where it came from and where it's going.

Gabel: Can you give us a little of your background?

Harp: I've been in electronics all my life. I really became interested when I was 10 years old while building a crystal radio, because I lived in an area that had no electricity. I didn't want to miss any of the latest episodes of Tom Mix and so forth, and I've always been interested in the way things work.

As far as education is concerned, I went to MIT as an undergraduate and studied physics. I went to Stanford as an Electrical Engineering graduate student, and received a PhD. After that I was on the faculty of Cal Tech for five years. I was then a staff member at the Hughes

Research Center working on electronic devices for five years.

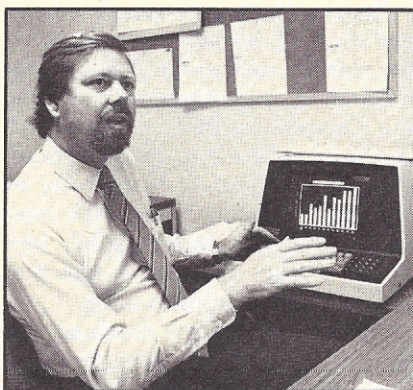
Gabel: When did you get involved with computer technology?

Harp: While working at Hughes, I also did some consulting for a company building video games. While the first video games were strictly TTL (transistor-transistor logic, a kind of fixed-logic, as opposed to programmable, chip), the games became much more sophisticated with the advent of the microprocessor.

We developed a video game using the 4004, a four-bit processor. And about a year or so later, the semiconductor industry came out with the 8080, an eight-bit microprocessor. I was so impressed with the 8080 com-



"It's very easy for an executive who has been using an IBM mainframe to justify the purchase of a \$3000 to \$4000 IBM personal computer."



"The intelligent consumer would do well to determine what he wants the machine to do, and make sure that the machine he buys can accomplish the task."



"Software has to allow them (middle managers) to accomplish certain tasks without knowing anything about operating systems or high-level languages."

INTERVIEW

pared to the 4004, that I knew this was something that would make a good small computer.

It was about this time, I believe in January of 1975, that MITS came out with its first desktop computer using the 8080, so I immediately sent off an order for one of those. That was the first system I had up and running.

Gabel: So you were in on the ground floor of personal computing.

Harp: Yes, and it was an amazing phenomenon. In those days you'd spend a week just trying to get BASIC to load from a paper tape through a clunky old Teletype machine. Typically, it would take about 15 minutes for a tape to go clunk, clunk, clunk through the thing.

I remember the first time I got BASIC up and running; I was just ecstatic with the achievement. Though I was involved with using the computer personally, in the back of my mind, I always knew it could be something that could make a business. So I planned to start some kind of a company that could take advantage of the market that was developing.

Gabel: Was that market strictly hobbyists, or was it also a business market?

Harp: It was definitely a hobby market. There was a very interesting phenomenon at that time, too—the computer club. The Southern California Computer Society started out in Don Tarbell's apartment. (Tarbell Electronics is now a successful computer manufacturer located in southern California.) Within a few months it had gained thousands and thousands of members and met in various places, such as the cafeteria at TRW. There was such enthusiasm for just getting together with others, sharing equipment and swapping ideas. Later, the desire for information became satisfied by magazines like *Personal Computing*. So that society, and other societies, withered away.

But I knew that if there were that many people interested in something, it's got to turn out to be a large business—and it did. Even though the first small computers were very

awkward to use—you had to fiddle with the switches on the front panel for about five minutes to load in a bootstrap loader, and then you had to load a paper tape through the teletype machine—they evolved very rapidly. First came magnetic tape cassettes, and then disk drives. By



"There is one exotic reason why people purchase personal computers—they come to it with the idea that they're going to write a best-selling program and make a lot of money."

that time, which was several years down the road, I'd started Vector Graphic with my wife and a friend of hers.

Because there were already a number of small personal computers on the market, such as the Apple II, the TRS-80 Microcomputer Model I and the Commodore PET, we thought it would be difficult to compete head-on with that type of system. So we decided to develop a unit with more disk capacity, a better quality keyboard, display, etc., and target it at professional or business users.

Instead of selling a machine that has 4k of memory, (four thousand bytes of main storage capacity) we came out with one that had 48 or 64k in fundamental memory size. It had a high-quality screen, and the keyboard had a regular IBM Selectric-type layout, instead of the small keys that you couldn't type on.

Gabel: Were your early computers successful in reaching the small-business sector of the personal-computer market?

Harp: To a degree. But I think that among the people we initially sold our equipment to, there were many who just wanted it to develop programs. Then as the business software matured, we were able to sell larger proportions of our hardware to businesses. The key item in this business has always been the software. The hardware has been available, but what has always limited the market has been the software.

Business software is the most complex type. For example, Peachtree software, which is available with our systems, takes about one million bytes (one byte is eight bits) of code. By contrast, simple games that were sold with the early personal computers might have only one thousand bytes of code. That's a thousand to one increase in the complexity of the required software.

And the amount of effort that goes into some software packages is even more remarkable. Our word-processing package, for example, took us four years to develop, and I'd estimate that there are about 10 man-years in it. That's a pretty big software investment for a company of our size.

Gabel: Still your investments apparently have paid off.

Harp: Yes, but it's becoming a much tougher market. Whenever you have a market that grows as rapidly as this one has, it opens the eyes of a lot of big companies. They start thinking, "How can we get a piece of that action?" You can see it in this case with Xerox or IBM. But getting a computer to market is a very complex task that involves different channels of distribution, the proper computer features, the proper price, and, most important, the proper software. Whether or not these companies have done their homework remains to be seen.

Gabel: Some people feel, though, that IBM's entry has legitimized the personal-computer business.

continued on page 108

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CIRCLE 7

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CIRCLE 10

EDUCATIONAL COMPUTING

Back to basics, forward to computing?

Many educators are demanding that computer literacy take its place beside the traditional triad of the three "Rs"

The impatient and impassioned calls for change in the 1960s had a tremendous impact on education as on other segments of American life. Educators were accused of being unresponsive to the modern needs of students and to the communities in which they taught. Curricula were chastized for being anachronisms, like grandfather clocks in condominiums—decorative perhaps, but out of place in the surroundings. And as Shakespeare was ushered out the back door, triumphant "innovative" courses such as Zen and the Art of Barbell Lifting were welcomed.

Things are coming full circle now, and teachers are returning to traditional education. But at the same time, these teachers have not abandoned innovation. So while reading, writing and arithmetic are still the foundation of modern curricula, more exotic subjects like computer literacy are being added.

To go with the new subjects, new teaching methods are being tried. In the Foothills Elementary School in Monterey, Calif., for example, sixth graders are teaching computing to their younger counterparts. Some educators feel that if computer literacy is to take its place with the three "Rs," it must be introduced to children early in their grammar-school years. Where this has been tried it has been well received.

Personal computers were first introduced into Foothills a few years ago when the video-display terminal

owned by the school district was loaned to the school for a quarter term. The time limit was necessary because the computer was being shared by all elementary schools in the Monterey Peninsula. But rather than enhance the overall school program at Foothills, the district's computer rationing only frustrated attempts to develop an adequate computer-learning program at the elementary level.

Dangling in midair

"As soon as any enthusiasm was generated among the students for this kind of class," says Mike Parrish, the resource specialist who created the Foothills computer curriculum, "the machine was yanked away, leaving everybody dangling in midair."

Last summer, though, a computer

jobber offered the school a discount on a Commodore personal computer, and the Foothills PTA quickly raised \$800 to buy the machine. Starting in September, computer literacy became a permanent part of the Foothills curriculum.

The program's setup is unique: Eight sixth-graders are taught to operate the Commodore, and they each teach one of the eight computer classes given every week to children in the first through third grades. There are five children in each class.

Because the computer class is offered to the students in the lower grades as a nine-week activity class—among other electives such as arts and crafts, cooking and field trips—it is easy to gauge its popularity: This year a majority of the eligible students chose computer literacy for



PHOTOS COURTESY OF DIGITAL RESEARCH

their activity period.

In developing the curriculum, and in his weekly meetings with sixth-grade teachers, Parrish stresses basic education and simple learning techniques. During the first few sessions, the students are taught, using flash cards, much computer jargon, such as byte, 16k and memory. After the words are mastered, hands-on learning takes over: The children are taught about the keyboard, i.e., alphanumerics, the graphics symbol and how the cursor operates and guides the computer user. Finally, toward the end of the course, simple programs are run.

Because there is only one computer for the five students to share and the attention span in young children is short, the instructors have chosen some time-tested ways to keep students' interest on the machine.

"The kids can get kind of fidgety in that room," Parrish says. "The sixth-graders are using interesting methods to encourage the younger children to pay attention. In one class a jar is put out for each student. With every correct answer the student makes, a rock is thrown into his particular jar. When the jar is full, the student is given brownies as a reward for good work."

An extra dimension

Parrish, a self-described "liberal-arts person, the antithesis of a computer mind," says he is impressed by the extra dimension that computers bring to a child's learning experience. With more and more children at Foothills becoming literate in the workings of the machine, Parrish feels that the computer should be established as a permanent tool for expanding the curriculum in such areas as math, spelling and writing. Unfortunately, he adds, many of the other teachers at Foothills also feel that the computer brings an extra dimension into their lives—a negative one.

"Before it can become a wide-

spread educational tool," Parrish says, "we have to get teachers to like the machine. Now teachers look at it with one eyebrow raised, as if it were a threat to them or a strange intervention in their orderly existence."

Art Luehrmann, a former faculty member at the University of California and computer educator, sees this reaction by teachers as a direct result of their paltry technological training at the teachers' colleges, and the situation hasn't changed much in recent years. "The present batch of teachers was educated 15 years ago when no one could predict that children would be learning about computing," Luehrmann says. "But even today, only five or six teachers' colleges have courses in teaching computing."

Luehrmann and an associate, Herb Peckham, are attempting to ameliorate this situation with a dose of what could be termed on-the-job computer training for teachers. The two men have founded a firm called Computer Literacy in Berkeley, Calif. Their goal is to walk teachers through teaching computing as a regular subject.

"The plan is to have a textbook that doesn't care what kind of computer equipment you are using—a universal guide," he says, "and to have a helpful lab manual for each brand of equipment."

At present, Computer Literacy's textbook, with an Apple II lab manual is undergoing a field trial at 600 schools across the country.

Luehrmann believes that technology touches all aspects of the way we live, and that computers are technology's messengers to society at large. Understanding computers, he adds, provides basic clues to functioning in today's world.

"When we teach math and literature," Luehrmann says, "we don't try to predict how children will use this training. We just know that to be able to function in a society you need literacy in math and literature. Simi-


larly, if you master computers, you become cognizant of a different way of thinking that is necessary in modern times."

Espousing computers

Luehrmann and others who espouse this concept apparently have touched a live nerve in education. More and more schools are turning to teaching about computers—their parts and their language—almost exclusively by using personal computers. Recent statistics, says Luehrmann, show that 100,000 computers are placed in schools, with three-quarters of them in high schools. Analysts predict that this figure will grow by 60 percent annually.

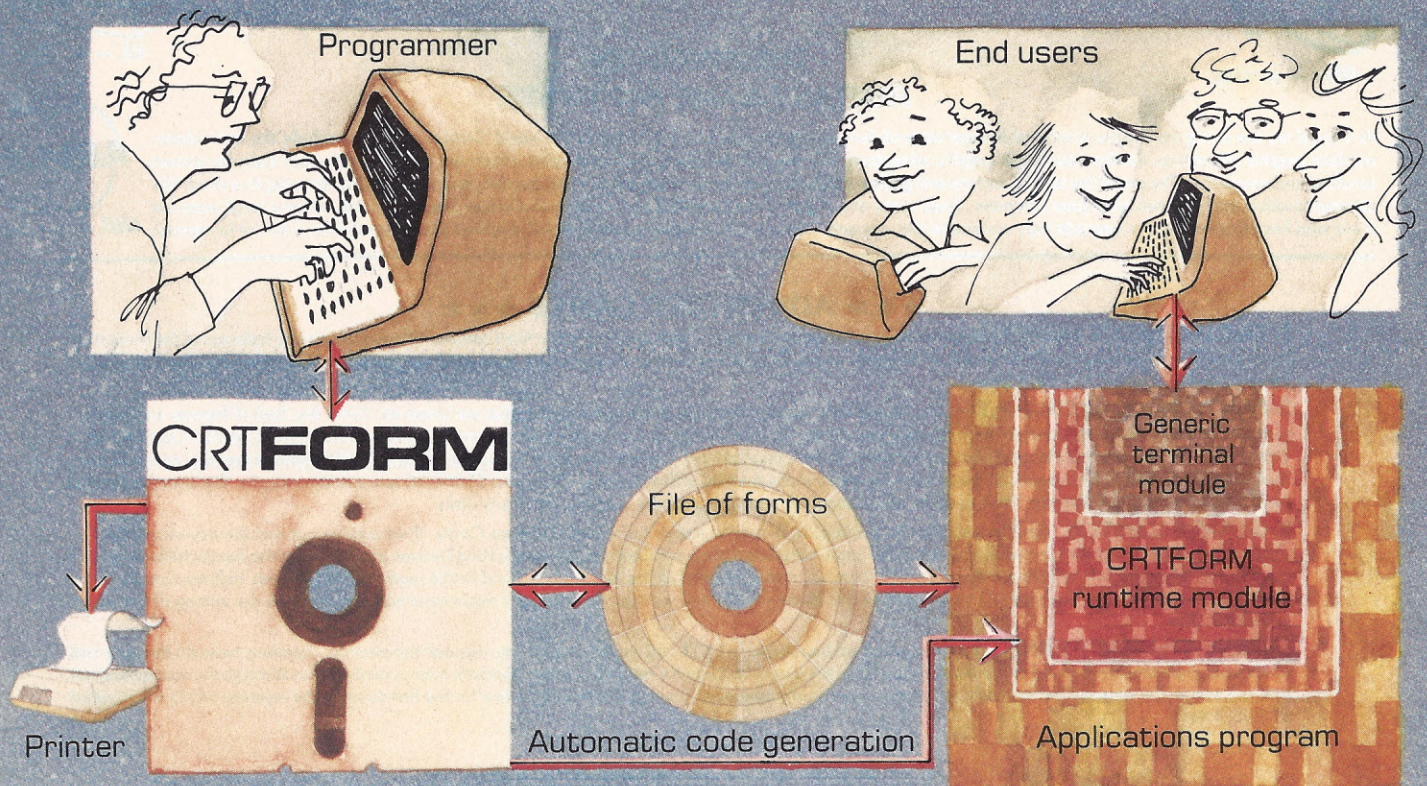
Defining priorities

A bright future is undoubtedly in the cards for computing as a subject in the school system, but, at least today, simple economics appear to be dictating where computing is being welcomed and where it is being shunned. Poorer school districts, for instance, with a melange of educational problems, are not making the purchasing and teaching of computers a priority.

"This is a middle- to upper-class school district," Parrish says of Foothills School. "Our PTA was given a choice of using its surplus funds for more field trips, for instance, or for purchasing a computer, and without hesitation the parents chose the computer. That's at least in part because these people have already been introduced to the machines in their daily lives. Many of the parents out here are working in professions where they use computers to help them in their daily bread-earning activities." 

Jason Birmingham is a freelance writer who wiles away his hours studying high-technology markets, particularly personal computing.

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PROFESSIONAL COMPUTING



PHOTO BY KEN SCHROERS

Personal computers get stamp of approval in direct mail

Personal computers (which can generate very specific mailing lists) allow direct-mail marketers to aim their mailings with the precision of a rifle, rather than a shotgun

Almost every direct-mail list is now somehow generated by a computer," says Richard Curran, of New England Services Group in Boston, who has more than two decades of experience in direct-mail lists. Over the years, Curran has seen many changes in the industry; the most striking has been the industry's use of computers to compile, sort, segment and classify lists of names with great accuracy and speed.

Curran has dealt mainly with large computers and data-processing departments. But as more and more personal computers are used in mail-marketing activity and in homes and offices in general, the direct-mail marketing business, as Curran has known it, may become extinct. Electronic mail, which speeds messages between individuals, from computer to computer, may ultimately alter the direct-mail business.

Long before that happens, however, personal computers and their large counterparts will significantly alter the mail-marketing business. Curran notes that "the days of giant mass mailings are gone"; rapid increases in postal rates and production costs, combined with the efficiency of computers, have worked to decrease the size of most mailings.

Because computers can generate much more specific lists, it is no longer necessary to go to the expense of a large mass mailing. For instance,

you needn't any longer mail to every business in a particular city when you only want to reach businesses with annual sales of \$5 million or more. A computer-generated list can be purged of all names that don't meet your criteria. The result is a smaller, but more specific, list. The computer allows a direct-mail marketer to aim his mailing with the precision of a rifle, rather than a shotgun.

Curran's idea of a small mailing is 5000 or more names and addresses. For many small businesses, 5000 names is far more than they need or could afford. That is where personal computers come in handy.

Compiling lists

Bill Bellamy, a private direct-mail consultant in Mansfield, Mass., and a colleague of Curran, is very familiar with the direct-mail-marketing plight of small businesses. One of Bellamy's clients, Patriot Fence, a Mansfield, Mass., fence manufacturer, knew that its total potential customer base comprised only 400 to 600 fence installers in the Northeast. If Patriot wanted a commercial list of those companies, it would have to purchase a minimum of 5000 names, most of whom were not potential customers.

Instead, Patriot decided to compile its own list from telephone books and fence-industry directories. Each name and address was recorded by hand and the company kept track of

response to the mailings; the list was continually updated and corrected by hand. This was the beginning of an effective direct-mail campaign, but the cost to maintain the mailing list was high.

Eventually, Patriot opted for a small-business computer that incorporated the mailing list as well as all the bookkeeping, inventory and invoicing functions into one program. One basic list of names provides the foundation for all Patriot's business activities. When a name and address are changed on one file, they are automatically changed on all the files.

Patriot can also segment its list according to the needs of a particular mail campaign. It can generate lists according to selected zip codes, the size of previous orders, active or inactive customer status and other data. Patriot couldn't purchase a list as good as the one it had developed over the years with its small-business computer. "We could never afford to do list sorting by hand," says Bellamy.

Not everybody is fortunate enough to have a direct-mail consultant like Bellamy to guide them in developing a mailing list. Still, if you have a personal computer, you can use it for mail marketing like professionals, but geared to your exact needs. In fact, any extra mail-list programs aren't necessary, although they can be very helpful. Mail-list programs are available for every major person-

al computer; prices range from \$200 to \$500 or more for very sophisticated programs.

Segmenting markets

Bill Murphy, advertising manager of *New England Advertising Week* magazine in Boston, Mass., turned Digital Equipment's stand-alone word processor that his small publication (circulation approximately 11,000) uses for its subscriber list into an effective mail-marketing tool. Relying mainly on word-processing programs, Murphy creates sales let-

tered out for different names.

"The printer is a problem," says Murphy. The dot-matrix printer was purchased to print subscription labels, not sales letters. "You can tell it is a computer letter," he says, even when it is printed on the magazine's letterhead stationery, one sheet at a time.

To overcome the form-letter problem, Murphy follows up his mailings with telephone calls. Whether he gets a sale or not, the information he gleaned from such helps in updating his mail list and gives his mailing a

second set of dots fills in between the first set. This greatly improves the quality of the printing, although the printing speed is cut by 50 percent.

But speed is not important to him, since he only sends out mailings in dozens of pieces. His mailings are primarily changeable (variable) block letters—essentially a form letter in which he can change certain key data so each letter appears to be individualized.

Using tractor-feed paper backing on which he has attached his own letterhead stationery and envelopes, he can run the printer continuously instead of feeding in paper one sheet at a time. Sheet feeders can cost \$400 or more; putting on tractor-feed backing costs only a couple of pennies per page.

Robert Radding, the sales manager of a small sign and display company operating in Rhode Island, Connecticut and Massachusetts realized that he was writing the same sales letters over and over again, with a few standard variations. Over a period of years he kept a file of what he considered to be his best letters—those which dealt with the particular sales issue in the best manner. As he answered inquiries and sent out new business solicitations at a rate of several dozen each week, he would simply rewrite certain paragraphs from the letters he had saved, making slight changes where necessary.

After seeing a demonstration at a computer show, he decided to buy a Commodore CBM computer system with a letter-quality printer. Now he saves the letters he considers best on a separate diskette, which he calls a "document disk." He has also memorized particular paragraphs that address specific points; most customers ask the same questions and have the same concerns.

Now when he sends out his mailings, he simply calls up the appropriate letter and inserts, deletes and changes the text as necessary, or he constructs a new letter, often just by combining paragraphs that he has already put into the memory. He adds only personalized opening and closing paragraphs. The customer

"While you don't need special list-management programs to use a computer for small-scale direct-mail marketing, such programs can be very helpful."

ters to solicit industry ads for special issues and magazine promotions.

The magazine's subscription list, stored on dozens of 8-inch floppy diskettes, is difficult to segment for Murphy's purposes. So he is developing his own lists as separate files. Many of the names he puts on his list are also on the subscriber list, but he gets them from records of past advertisers, inquiries that come into the magazine, and from the magazine itself as he scans the pages for personnel and account changes.

Murphy codes each name on his advertising list, noting where the name originated, the names of ad agency clients, information about past contacts and the date. He can then easily mail to the entire list or to selected portions of it.

For a recent mailing concerning an upcoming special issue, Murphy wrote a sales letter and pulled from the sales list the names of those organizations that had advertised in the same special issue in previous years. The renewal letter was printed for each name of the list. A second letter for new prospects was written and

personal touch. Using the DEC list-management program, Murphy can put other useful information into his list file that will not be printed out with names, addresses and salutations. However, there is a 2300-character limit to each entry in the list-management program.

A free-lance fundraising consultant who wishes to remain anonymous, has also been struggling with the dot-matrix-printer problem. He does mail marketing in search of new clients and as a fundraising service for his current clients, and he needs better quality printing for these letters.

Improving quality

His \$5000 personal-computer system includes a Zenith Z80 computer, a dual disk drive, an Epson printer and Magic Wand word-processing software with its changeable block-letter capabilities. To keep the price that low, he had to forgo the letter-quality printer, but a feature of the Epson helps to compensate; the printer can make a second pass over a letter at a different setting so that the

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AUTOMATIC
WHAT-IF

MODE=NORMAL ORDER=R/O ROW=1-50 COL=1-20

ROW 1 (Net Sales) <--
ENTER COMMAND:

ROW	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total	40 MATH:
---	---	---	---	---	---	41 ADD
1 Net Sales	1,000.0	1,100.0	1,210.0	1,331.0	4,641.0	42 SUBTRACT
2 Cost of Good	450.0	489.5	532.4	579.0	2,050.9	43 MULTIPLY
3 Gen & Admin	200.0	220.0	242.0	266.2	928.2	44 DIVIDE
4 Res & Develo	300.0	350.0	400.0	450.0	1,500.0	45 NEGATE
5 Total Costs	950.0	1,059.5	1,174.4	1,295.2	4,479.1	46 INVERSE
6 Gross Profit	50.0	40.5	35.6	35.8	161.9	47 INTEGER
7 % Profit	5.0	3.7	2.9	2.7	3.5	48 ROUND
8	0.0	0.0	0.0	0.0	0.0	49 CUMULATE
9	0.0	0.0	0.0	0.0	0.0	50 ABSOLUTE
10 % C.O.G.S.	45.0	44.5	44.0	43.5	0.0	51 ADD K
11	0.0	0.0	0.0	0.0	0.0	52 SUB K
12	0.0	0.0	0.0	0.0	0.0	53 MULT K
13	0.0	0.0	0.0	0.0	0.0	54 DIV K
14	0.0	0.0	0.0	0.0	0.0	55 SUM
15	0.0	0.0	0.0	0.0	0.0	56 GET
16	0.0	0.0	0.0	0.0	0.0	57 ZERO
17	0.0	0.0	0.0	0.0	0.0	58
						59

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gets an individually written letter on company letterhead, and he can knock out five to 10 letters in an hour—the time it would take him to write two letters from scratch. Gone, too, are retyping and concern about typos, which, he says, were loathsome chores since he does not have a secretary.

Getting ambitious

Getting more ambitious with his computer, the sign and display executive is assembling a mailing list based on past and current customers, plus names and addresses of potential customers, which he takes from local trade newspapers and directories and telephone books. Since he has no list-management program yet, he is basing his list organization on the variable-block-letter format included in his Word Pro 4 software from Pro-Micro Software. Each entry consists of a name, address and salutation.

batch of several dozen he sends out, he gets a handful of responses and new inquiries. To get that many new business contacts in the past would take a week of telephone calls or a month of personal sales calls.

The project has been so successful that he is turning the computer over to his wife, Rina Radding, to use in searching for a new job. As a psychiatric social worker—a job market that is particularly tight—she faces an especially grueling job search.

She has already used the computer to print more than 100 copies of her resume. Each resume must be accompanied by a cover letter. She uses the word processor to grind out “individualized” cover letters from the two or three variations she has put onto a separate diskette. Each Monday, after scanning and clipping the Sunday help-wanted ads, she goes into the office and finishes the week’s

code, salutation and inside address. Others may be particularly suited for your own business, such as eye color or number of trucks. The better list-management programs allow for more of this kind of classification. Some programs allow for unlimited classification, but limit the total number of characters for each entry; others may allow you only five open fields which you may define and fill in. An Apple Computer representative says that his company’s programs allow for as large an entry as the machine can handle.

The ultimate limit for a small computer is the amount of memory storage it can access. Of course, you can juggle diskettes endlessly, but two disk drives’ worth is the maximum amount of data that most people massage at one time. With the trend toward hard-disk, Winchester-type drives, personal computers will suddenly have rapid access to much more data and make list management much more versatile.

The best programs will allow you to sort programs in a variety of ways. For instance, one popular program will pull out selected zip codes, but will not put a list of names and addresses into zip-code order. If you must have your mailing list in zip-code order (for bulk-mailing purposes), you may have to call up your list zip code by zip code. While that isn’t an impossible job for a small community, it would be very difficult if you wanted to mail to addresses in a large metropolitan area.

Other types of sorting allow you to put a list in alphabetical order (an important feature when trying to track down individual names in a large list), or will purge your list of duplicate names. Sophisticated programs will allow you to make a single input in one file and will update all other files accordingly. For instance, changes made in a billing file may be reflected automatically in a mailing file.

According to Bellamy, the key to the success of any mail-marketing campaign is the list itself, and it is in the handling of the list that personal

continued on page 91

“Because computers can generate much more specific lists, it is no longer necessary to go to the expense of a large mass mailing.”

To achieve list segmentation, he is setting up separate files for each geographical region his company serves. One file will be for the Providence, R.I., market, another for Hartford, Conn., and another for Springfield, Mass. Current and past clients in each market will be grouped together, while potential clients will be kept separate. By limiting each file to 25 entries, he can achieve a maximum amount of flexibility while using his system to its fullest capacity. So far, he has put dozens of files on a single, 5-inch diskette.

With this file arrangement, he can design form letters with an appropriate sales pitch for each client group. The computer will run a letter for each name in the file, filling in the name, company name, address and the appropriate salutation. For each

resume mailing in about an hour, leaving her more time to follow up on callbacks and interviews.

Organizing info

While you don’t need special list-management programs to use a computer for small-scale direct-mail marketing, such programs can be very helpful. Mail-list programs provide for a variety of list-sorting devices. Using a code, you can organize the information for each name in the list according to a variety of factors. You can then ask the computer to search for listings relating to one or a combination of factors, and pull out all the appropriate listings.

These sorting arrangements are often referred to as “fields.” You define the information in each “field”; some fields are pretty standard, such as zip

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CIRCLE 16

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Time management: business in its finest hour

**Time-management programs today are more
than just electronic appointment books**

Time is money, and business owners and professionals know that squandered time and inefficient scheduling are poison for any going concern. But how does one determine how to schedule and apportion duties for the best results? Many business professionals are finding that these times demand time-management software.

"For years, one of the biggest problems we had was the proper scheduling of work so that it went out on time," says Al Smith, the owner of Smith Collision Clinic in Sloansville, N.Y. "So far, this software is working great for us."

Smith is referring to a time-management program called Time Deadline Calendar/Scheduler by Charles Lefkoff. More and more business and professional people like Smith are discovering the usefulness of personal computers in time management.

Time-management programs are being used for everything from juggling attorneys' court schedules and appointments, to keeping track of

complicated client billings for accounting firms, to helping decide which mechanics will work on an auto-body repair and when that repair can be completed. While lawyers and accountants are obvious candidates for time management, any business or profession in which scheduling is important can benefit.

What's it worth

If you think you might be a candidate for time-management software, consider the benefits. How different might things be if you always knew how to manage your time? Then consider what would happen if you knew how much your time was worth—not just by the hour, but for the next few weeks or months. What would that be worth? Would credit be much easier to get?

Smith thinks so. "Suppose I have to borrow money. The banks know how much money I have in my savings and checking accounts, and, with the time-management program, how much work I've committed myself to for the next few weeks."

Users of time management, es-



PHOTO BY STEVE EISENBERG

pecially those who charge customers according to time, find that they not only know how much money should be coming in, but that they can also schedule themselves to earn it more efficiently.

But using a personal computer for time management provides much more than an electronic appointment book. Programs like the one Smith is using allow the user to rate jobs by priority, so that important work is completed by the deadline. Meanwhile, the computer keeps track of money earned.

While an auto-body shop may not seem the most likely spot to find a personal computer, Smith is enthusi-

puter provides him with a calendar printout for each man. At a glance, he knows weeks in advance exactly what work will be done by whom. And the computer automatically provides him with the dollar value of the time.

As a result, he says, "My customers are getting their cars back on time. I can see far enough into the future so that I can call my customers and say, for example, 'Look, don't bring your car in on the fifteenth, we've run into a snag with getting some parts.' Before, I never knew whom to call or when to tell them to bring their car in, so I just let them bring it in as scheduled. Then I'd end

Eye into the future

Smith, like the other users interviewed, finds it invaluable to know in advance what his earnings should be. "I know how many dollars' worth of business I have coming in. Before I had the computer, I couldn't tell how much money I would have coming in in the next few weeks."

By far his most startling assertion is that the computer has made his repair-work deliveries so reliable that he plans to use it as a selling point for future advertising. "I'm going to use it as a marketing and advertising strategy to pull in future customers. I plan to offer a rental car to the customer if I can't get the car out on time."

Smith, a gemologist in his spare time, has also written programs to help him in giving diamond appraisals. "It helps me to be very competitive," he comments. When asked if he would recommend the use of time-management software to others, he reacts with unbridled enthusiasm: "I'll be honest with you," he says, putting his feet up on his desk, "I personally feel that if a company has a backlog of work, and it's having difficulty meeting time schedules, it would be worth purchasing the computer just for this program. You're only looking at an investment of about \$4000. If you could make sure your men are working to their capacity all the time without any lulls—and without any backlogs or excessive work to do, which creates morale problems... if for that \$4000 you can increase your productivity and make sure your business is being managed smoothly without any problems due to scheduling—it's worth every penny."

Counting the hours

Professional Time Accounting, a package distributed by Lifeboat Associates in New York, was originally written by Steve Blay for Douglas D. Tracy, president of Tracy Consulting, a Cortland, N.Y., accounting firm.

"In the accounting profession, we only have one thing to bill," says Tracy, "and that's time. We have to

"Using a personal computer for time management provides much more than an electronic appointment book."

astic about his TRS-80 Model III. He seems to consider it as important to his business as his best mechanics. His computer is equipped with 48k of RAM, two disk drives and a line printer. It is displayed prominently on the desk in his office. Computer-printout calendars decorate his walls—these are the work schedules he creates using his time-management software.

Smith, too, knows the importance of keeping track of time: "I work with hours, and I work with priorities. In this business, you don't talk dollars, you talk hours."

How has a personal computer changed Smith's auto-body repair business? "I know now where I stand," he says. "Before, I honestly didn't. Making up a schedule was literally like throwing darts at a board. Now, when customers come in, I no longer have to consult a calendar that looks like a checkerboard and wonder where to put them."

Smith keeps a schedule for each of his men on a separate disk; the com-

up having to make excuses as to why their car wasn't done on time. The computer pretty much eliminated this problem."

Complete control

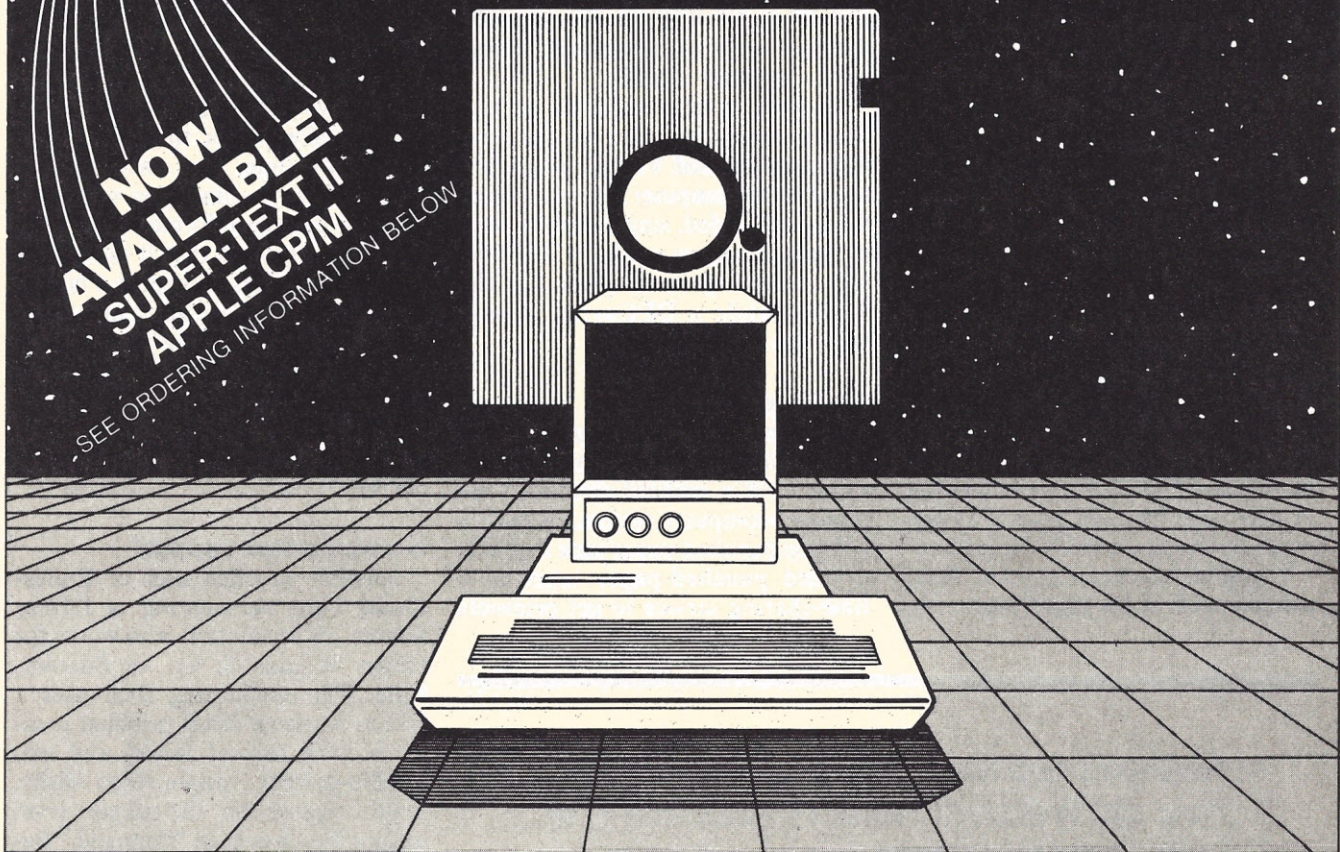
Smith insists that the system is easy to use and affords complete control of scheduling. He assigns each task a priority of from 1 to 9 (9 is highest priority), and the computer automatically arranges the schedule so that high-priority tasks are assigned first. The minimum number of hours per day that should be spent on a particular job is entered as well, along with the estimated hours required for completing the task. The computer sees to it that each job is assigned a sufficient number of hours on the schedule so that it can be completed before deadline.

Smith says the information the computer requires "is simple for anyone in my business to enter, because I work with hours, and I work with priorities. This program fits my situation well."

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CIRCLE 45

convert time into dollars. Under the old manual system, we used to keep track of hours. Then when it came time to send out a bill, we'd convert time into dollars. It was a very time-consuming process, and there was no way to break down how the time was spent. Since there was no way to keep records of what we were doing, we just kept time records."

Tracy says the computer has allowed him to automatically convert time into billing dollars, so that he knows how much of a bill is due from a client at any time. "The computer also enables me to get a breakdown of what different services cost us time-wise, so we can determine appropriate billing rates. It gives me a lot more detail and a lot more knowledge of what it is actually costing to provide services to an individual client."

Using his computer system, Tracy assigns each of his employees a dif-

ferent billing rate, depending upon his education and experience. When the computer calculates a bill, it multiplies the employee billing rate by a factor that adjusts for the actual tasks being performed. Tracy has the tasks broken down into bookkeeping, tax, accounting, management and advisory, auditing and financial-advisory services; non-billable hours, such as staff training and vacation time are kept separate. Rates are automatically built into each client's record.

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Enhanced detail

Perhaps the most intriguing part of Tracy's story is that, during the transition from a manual system to the personal-computer system, he used a Monroe punched-paper tape machine to send punched-paper tapes to a time-sharing service to get printouts

can get a printout and see how my employees' time has been spent. Then I can see whether I have a lot of unbillable time I have to absorb, or whether it's all billable time."

How much of his own time does Tracy save with the new system? It used to take two or three days of a secretary's time, plus two or three days of Tracy's time, just to gather together enough information to do a billing. He reports that it now takes five or 10 minutes to prepare a bill for a client, and only one day a month for all clients—even during the tax period, which used to require considerable extra billing time.

"Looking back now," he says, "I don't know how I was able to do it the old way."

Customization support

Another satisfied user of Professional Time Accounting is Jeffrey Sauter, an accountant who works for Gillan Wilkins & Co. in Boulder, Colo. The accounting firm uses a Sierra National 3000 personal computer with 64k of RAM and two double-density, single-sided disks. Sauter reports that the support from author Blay has been "fantastic." Because the firm's system configuration is unusual, the package has required customization, and Sauter says Blay has been very cooperative in this vein.

Sauter previously worked with mainframes, both in school and at another firm. How does he compare mainframes and personal computers? "Since we're the sole users on a personal computer the feedback is a lot quicker," he says. Sauter admits that a personal computer runs slower than a mainframe, but finds that, in the end, the processing turnaround is quicker.

The firm is planning to add a tax-preparation program next year, and it is already using the computer for calculating depreciation and loan amortization. Since he finds the machine relatively easy to program, Sauter plans to write programs for oil- and gas-depletion calculations, since his firm is heavily involved with that sort of work.

Sauter reports that three partners

"Before I had the computer, I couldn't tell how much money I would have coming in in the next few weeks."

ferent billing rate, depending upon his education and experience. When the computer calculates a bill, it multiplies the employee billing rate by a factor that adjusts for the actual tasks being performed. Tracy has the tasks broken down into bookkeeping, tax, accounting, management and advisory, auditing and financial-advisory services; non-billable hours, such as staff training and vacation time are kept separate. Rates are automatically built into each client's record.

"The client is actually paying for the services rendered, and at the proper rate," Tracy says. He adds that this is much fairer to clients who are billed yearly. Before rate changes and various hourly charges were built into the time-management/billing

of billing information. How does his personal computer compare with the time-sharing service?

"We now get much greater detail and we're much more efficient and current on our billings. We load the information on a weekly basis, which means that, at any time, I can determine where we stand with a given client."

If for instance, a client has authorized work up to a certain dollar amount, Tracy knows just when that dollar amount has been reached, and he can contact the client for a further authorization.

The efficiency of Tracy's system extends to the use of his employees' time as well. "By using the computer and the program, at the end of the month or at the end of any period, I

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PROFESSIONAL COMPUTING

used to spend a full day preparing month-end billing two days during tax-preparation season. The computer has cut the time to two hours.

A date with a lawyer

Bernard O'Hare, a partner in the law firm O'Hare and Heitzman in Bethlehem, Pa., uses Datebook from Lifeboat Associates. Datebook, running on a Zenith Z-89 personal computer with dual 8-inch double-density floppies, keeps track of appointments for three attorneys. Before they began using Datebook, the attorneys had difficulty keeping track of one another's whereabouts. This made it difficult to arrange meetings and determine who would be in the office at any given time.

Now, any of the attorneys or a secretary can enter an appointment

ment? The biggest problem users have is obtaining the software, but due to the efforts of programmers like Blay and Lefkoff, good software is now available, and both men will provide customization support.

One software vendor, who wishes to remain anonymous, says that his company withdrew a time-management package from the market because it found little serious interest in that type of software. "We were selling lots of demo disks and sending information all over the place, but there weren't enough sales to justify keeping people here to answer phones about the package. So we dropped it."

That situation is likely to change. Hardware prices have been plummeting in recent months. Almost any personal-computer peripheral is now

"Since we're the sole users on a personal computer, the feedback is a lot quicker."

or check another attorney's appointment schedule. Since a great deal of an attorney's time is spent preparing for and keeping appointments, the computer has proved invaluable. For example, an attorney may need to begin preparing a brief several days or weeks in advance for a court appearance. This information can be entered into the computer to provide what O'Hare calls a "tickler." The tickler warns a partner that he must begin preparation by a certain date. In addition, whenever a letter is sent, the expected reply date is entered into the computer.

O'Hare says that Datebook has aided greatly in keeping the office running smoothly. An added bonus is that Datebook enables a secretary to prepare bills by using the month-end printout.

It's no problem

Are there any drawbacks to using a personal computer for time manage-

ment? The biggest problem users have is obtaining the software, but due to the efforts of programmers like Blay and Lefkoff, good software is now available, and both men will provide customization support. One software vendor, who wishes to remain anonymous, says that his company withdrew a time-management package from the market because it found little serious interest in that type of software. "We were selling lots of demo disks and sending information all over the place, but there weren't enough sales to justify keeping people here to answer phones about the package. So we dropped it."

That situation is likely to change. Hardware prices have been plummeting in recent months. Almost any personal-computer peripheral is now available at nearly half what it cost one to three years ago. Generally, the more recent models provide improved performance as well. That means that now many more people can afford a personal computer that exceeds the usefulness and computing power of an early-model mainframe, and those who can increase their earnings by owning one are going to be among the first to buy. No one stands to benefit from the use of a computer more than someone whose time is worth money.

If that means you, look around. How much time must you save to recoup the cost of the software? Chances are the software will pay for itself quickly. The new tax laws, along with today's lower prices, are making personal computers easier to own.

Bill Sudyam is a freelance writer from northern New Jersey.

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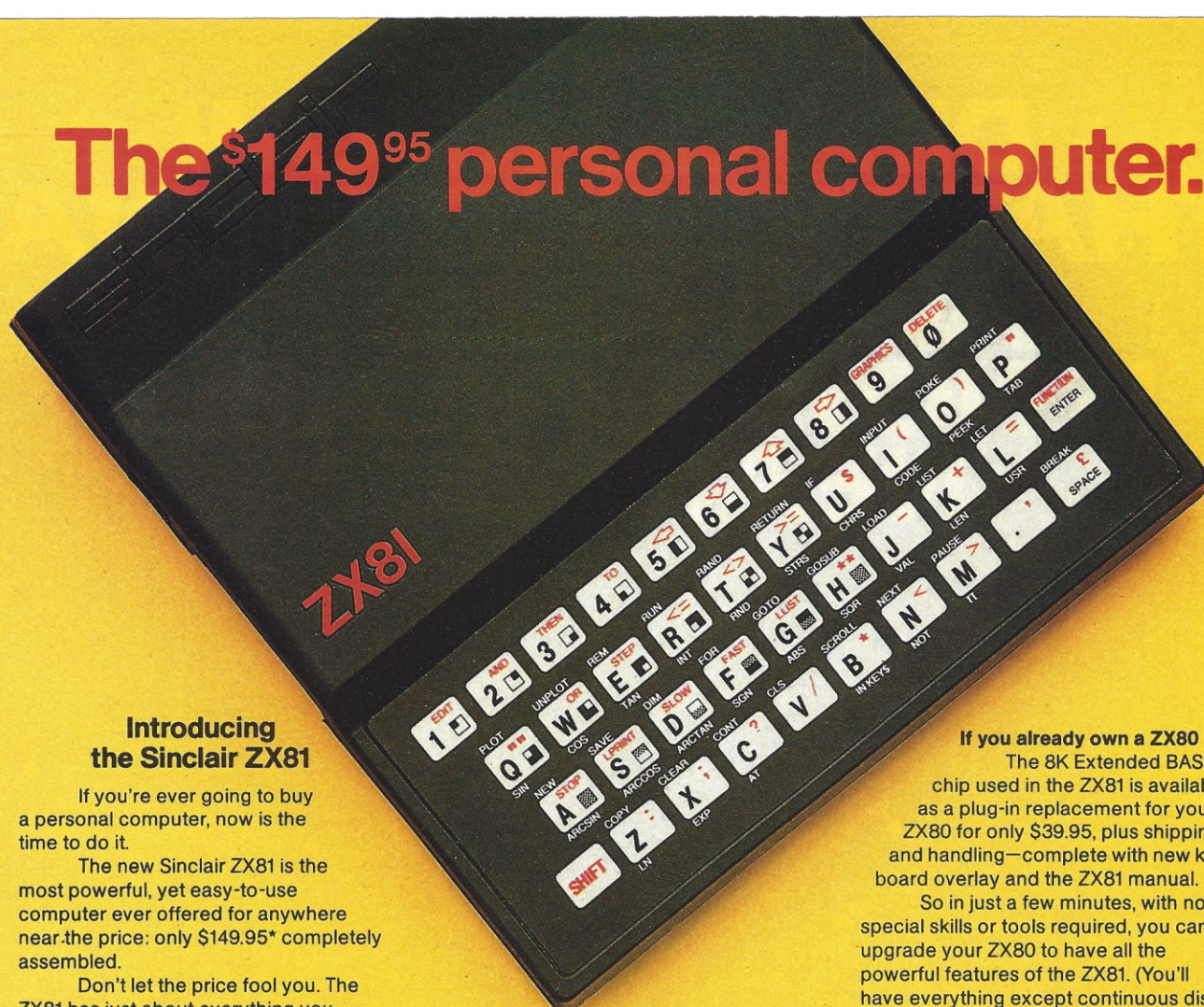


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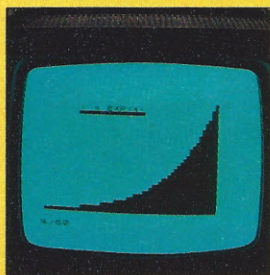
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Order at no risk**

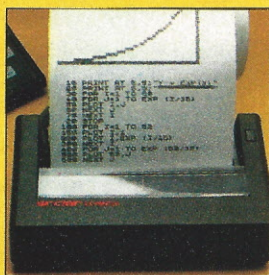
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Jason Birmingham and Betsy Gilbert

BUSINESS COMPUTING

Getting your just due with accounts receivable software

To err may be human, but when dealing with those receivables, to err can be costly. Personal computing can eliminate the human-error factor and can give businessmen fast and accurate data to keep the cash flowing

At the heart of every business, from the corner grocery to the megabuck corporation, is an age-old ritual—balancing the books. It's a simple matter of making sure that receivables are always greater than payables.

Unfortunately, that doesn't come easy to many businessmen. Sometimes failure to achieve a balanced account is a result of the economic times. Sometimes it's a result of bad business sense. But too often, it's a result of sloppy accounting: Someone simply forgot to record a sale, or left off a zero when adding up the day's totals.

There's not a lot that can be done about the state of the economy, and

bad business sense isn't likely to cure itself. Sloppy accounting, however, need not be a problem. With a personal computer and software written specifically to handle accounting, dealing with payables and receivables can be a breeze.

"In this kind of business, you've got to know where you stand dollar-wise at all times," says Bill Dineen, the owner of DEM Realty in Whitinville, Mass., a general contracting firm. "People who lose track of how much they're owed and how much they owe tend to find themselves out of business more often than not."

General contracting is a highly competitive profession that involves spending money to make money. Whether his firm is building a new

structure or remodeling an older one, Dineen knows he's going to be digging into his pocket for crew wages and materials costs before he ever sees a nickel from his client.

"If a contractor doesn't keep close tabs on what he's spending on a job, and keep the client informed of what's being spent, he can really take a beating when it comes time to collect," Dineen states.

Dineen took more than one beating during eight years of operating a business using "hit-and-miss" accounting practices. Then he decided to try something new.

"To get my payables and receivables on the right track, I would have had to hire a full-time bookkeeper, who would do nothing but watch the

PHOTO BY STEVE EISENBERG



money," Dineen says. "I decided I didn't want to go that route." Instead, he bought a TRS-80 Model II with Radio Shack's Accounts Receivable software package. Dineen believes it's far more reliable than any book-keeper he could have hired.

Error-free accounting

"This system just doesn't make mistakes," he says. "It's designed to perform an accounting function, and it performs without the human-error factor. I like that."

Dineen installed his system in July, and now has DEM Realty's accounts-receivable function down to a fine art. By sending out weekly invoices as the job progresses, he keeps the client current on what's being spent. If the client becomes concerned about costs, he can have Dineen make the necessary changes during the job, rather than complaining about going over budget when the job is completed.

"Having a client refuse to pay for a job once it's finished isn't uncommon in this business," Dineen says. "You quote a price at the beginning, and as the job progresses, you find that you'll spend an extra \$50 here and \$30 there. Although the client is approving those costs, he just doesn't realize how fast they can add up. When the contractor presents him with a final bill, the client then says it's way over the quote and refuses to pay."

A situation like that can break a contractor. Rather than taking a chance on that happening to him, Dineen developed the practice of sending the client a weekly invoice, covering costs to date.

"I might have a crew of 10 workers on a project," he says. "Each crew member fills out a sheet at the end of the working day, giving me the hours he worked and the amount of materials he used. I take the information from those sheets and key it into the computer. At the end of the week, the computer prints out two invoices, one for the client and the other for my records. Using this method, there aren't any questions about the bill when the job is completed."

Once an invoice is printed, the information it contains is automatically transferred into sales. Before it's printed, however, the software's edit option allows Dineen to make changes before the data are stored.

"If I were still printing invoices by hand, I'd have to do a lot of them twice because they would have errors," Dineen states. "The computer lets me correct the mistakes before I start printing."

When Dineen closes out a month, the computer automatically prints out a statement for that month. It also gives him trial balances for accounts receivable—with and without aging, updating and detail—all in just a few seconds.

"I'm a firm believer in doing everything myself," Dineen says, "and that includes the accounting. This system gives me all the information I need to function effectively as a profitable business, but minimizes the amount of time I have to spend in the office. What more could I want?"

Dan Rennie agrees with Dineen when it comes to computerizing receivables. Co-owner and manager of Pen and Brush art shop in San Jose, Calif., Rennie is learning how easy handling receivables can be with the aid of a personal computer and an efficient software package.

"In the six months since we got our system, I've seen the receivables situation go through some big changes," Rennie says. "We're not making the mistakes we were making before. The whole function is more streamlined and we're actually getting payments in faster."

Rennie uses an Apple II Plus with a 16k RAM card and the Accounting Plus Two 1.1 accounting package from Systems Plus in Palo Alto, Calif. The software handles every aspect of accounting, from general ledger to balance sheets to profit and loss statements, but what impresses Rennie most is the way it handles receivables. "Trying to manage your receivables by hand can drive you



crazy," Rennie says. "This system takes the worry out of keeping tabs on all our accounts and what they owe."

Each time a clerk makes a charge sale from one of Pen and Brush's four departments (art, engineering, graphics and framing) the sale is written up on a two-part form. The customer keeps a copy and one is retained for the store. At the end of the day, Rennie takes the information from the form and keys it into the computer. He then enters the customer account number and the computer automatically issues an invoice number, and gives the shipping destination and payment terms. The computer also automatically posts the sale to the correct sales department.

Computing tax

"When the charges are totaled, the system computes the sales tax, if one is applicable," Rennis says. "If I've previously programmed a discount for a good customer, it's automatically included in the sales total.

When I'm finished, I press a button and the data are stored on disk. The printer then prints out a final invoice copy."

One of the positive changes Rennie has observed since he installed his system is a substantially shorter time span between invoice shipment and payment receipt. "Right after I started sending out computer-printed invoices, my dating on the receivables dropped from more than 60 days to about 45 days," Rennie says. "Perhaps my customers feel that since I'm using a computer, I'm keeping a closer watch on my accounts."

Rennie plans to install the Accounting Plus Two 1.3 package, also from Systems Plus, which will provide him with the capability of handling eight sales departments, rather than just four.

Scratching the surface

As the keeper of a business' most cherished information—its money charts—a bookkeeper guides the ebb and flow of a firm's operations perhaps more than any other employee. And accounts-receivable data tell the bookkeeper just how rocky or placid the financial course is going to be.

Put simply, accounts-receivable information provides a broad overview that encompasses a company's historical trends and future planning. It contains customer files, generates monthly statements including past due information, produces overdue notices, balances the company check-book with up-to-date cash and receipts data, and chronologically details each account.

"Today's accounting programs and software are designed for manual operations, imitative of old-style bookkeeping methods," says Jesse Hillman, owner of Associated Data Systems, a Huntington Beach, Calif., systems integrator and consultancy. "This is because a lot of old-time bookkeepers are still employed and are used to these methods. What we have today, though it is much quicker and more effective than pre-computer days, is still just entering the kinds of data on the machine that we used to write into ledger books.

What we will have in the future are truly computerized accounting procedures."

Hillman, who says he has watched accounting software come and go rapidly over the past five years, expects that the personal computer will be the catalyst that brings accounting into the modern electronic era.

"There are a lot of people today who use personal computers," Hillman says, "and the machines are getting easier and easier to program. The users want them to do more and more, especially in improving business procedures. This demand from users will generate more sophisticated accounting programs from software specialists."

The big difference, according to Hillman, will be in the use of graphic displays, tables and other visual pictures. Many businessmen and accounting experts agree that being able to view a broad range of a company's finances in chart form—something that is possible with color graphics—makes the information easier to understand and reference than having to cull lists.

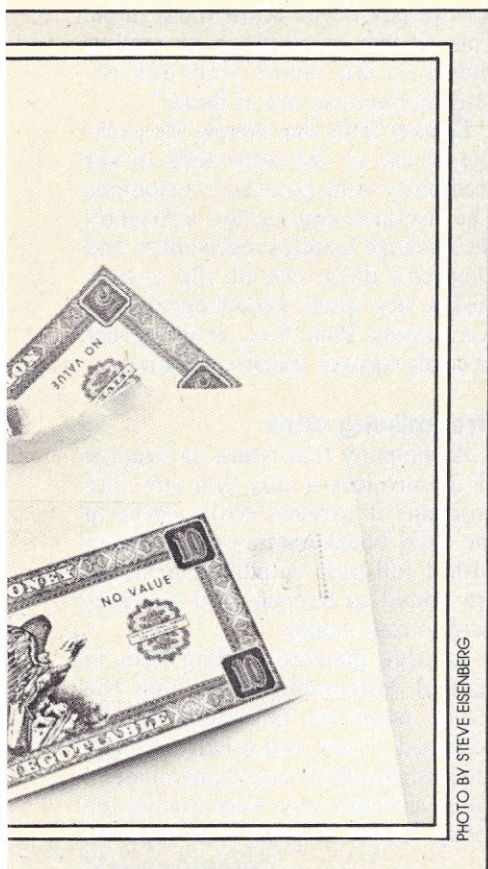
"The old-fashioned journal form of accounts receivables measurably slows the process," Hillman says. "A graphic accounting package like VisiCalc is definitely the wave of the future in this area. All the user has to do is fill in the blanks on a chart on the screen."

A double blessing

In the meantime, though, software retailers are doing a booming business with what's available.

Merle Dunker started selling Accounting Plus Two first, and liked it so much she decided to use it with her Apple II to handle accounts receivable in her store. Now she's finding a double blessing in that decision: Her receivables come in like clockwork and her customers are so impressed with her use of the package that they're buying it for themselves.

Co-owner of Computerland of Santa Clara, Calif., Dunker started selling Accounting Plus Two for the Apple about four months ago. After demonstrating the package for only a



BUSINESS COMPUTING

few weeks, she chose it over other available software for use in the store.

"We opened our doors in April, and for the first two or three months, our receivables weren't big enough to justify anything more than a manual

function," Dunker states. "As we grew, it became imperative for us to come up with a more efficient, time-saving way to handle the receivables. I decided on this package because it seemed to offer more than any of the others."

Computerland deals with most of its vendors on a cash basis. That means the store has to have fast turn-around on its receivables to maintain cash flow. With the Accounting Plus Two software, Dunker finds that cash flow is no problem.

"There are several big advantages to this system," Dunker says. "The audit trail is great—once you enter an invoice into the system, you never lose it. Another advantage is the aging feature. You can look at the computer's files, see who owes you money, and you can respond quickly."

Once a week, Dunker and her staff look at the invoices due for payment. They divide the list and spend about two hours on the telephone reminding the customer of the purchase-order terms and the date the invoice was sent. The staff then aggressively asks when payment can be expected.

"Usually the day after we make our calls, we can visit several customers and pick up large checks," Dunker says. Some people are very slow to pay if you allow them to be. This system reminds us to remind them, so we never find our receivables getting out of hand."

Dunker finds that having the package in use at the store adds to her credibility with potential customers. The customer can see how efficiently the package handles receivables, and Dunker's daily use of the system makes her more knowledgeable of Accounting Plus Two, enabling her to easily answer specific questions.

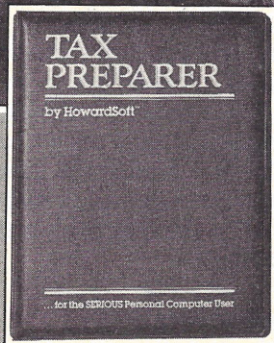
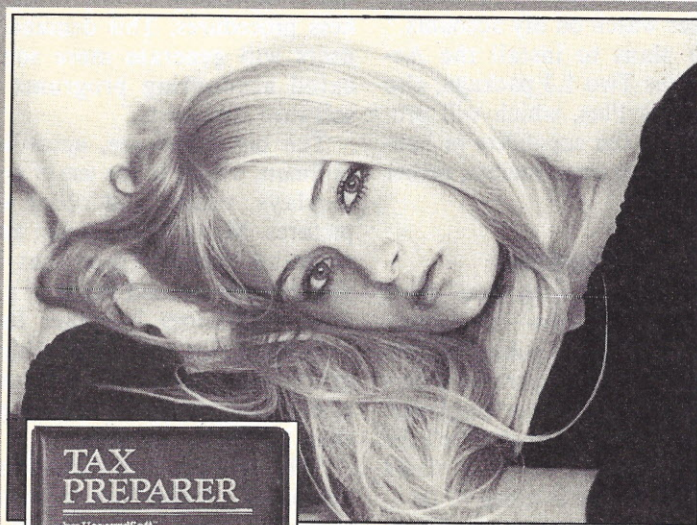
Streamlining data

A company that issues an average of 30 invoices a day can run into problems if careless errors occur in the daily bookkeeping process. Even with a full-time employee, mistakes are bound to happen, and mistakes tend to cost money.

A large plastics-molding firm in central Massachusetts, which the owner asked not be named, finally admitted a year and a half ago that the mistakes that were being made in the receivables area were getting too costly. "After 30 years of doing busi-

continued on page 95

RELAX!



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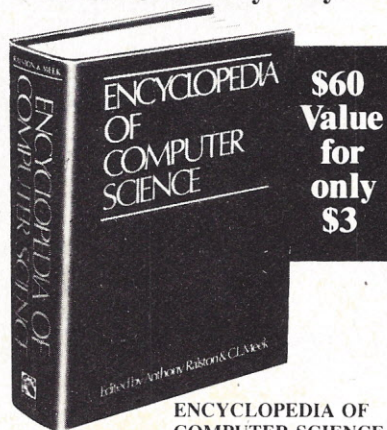
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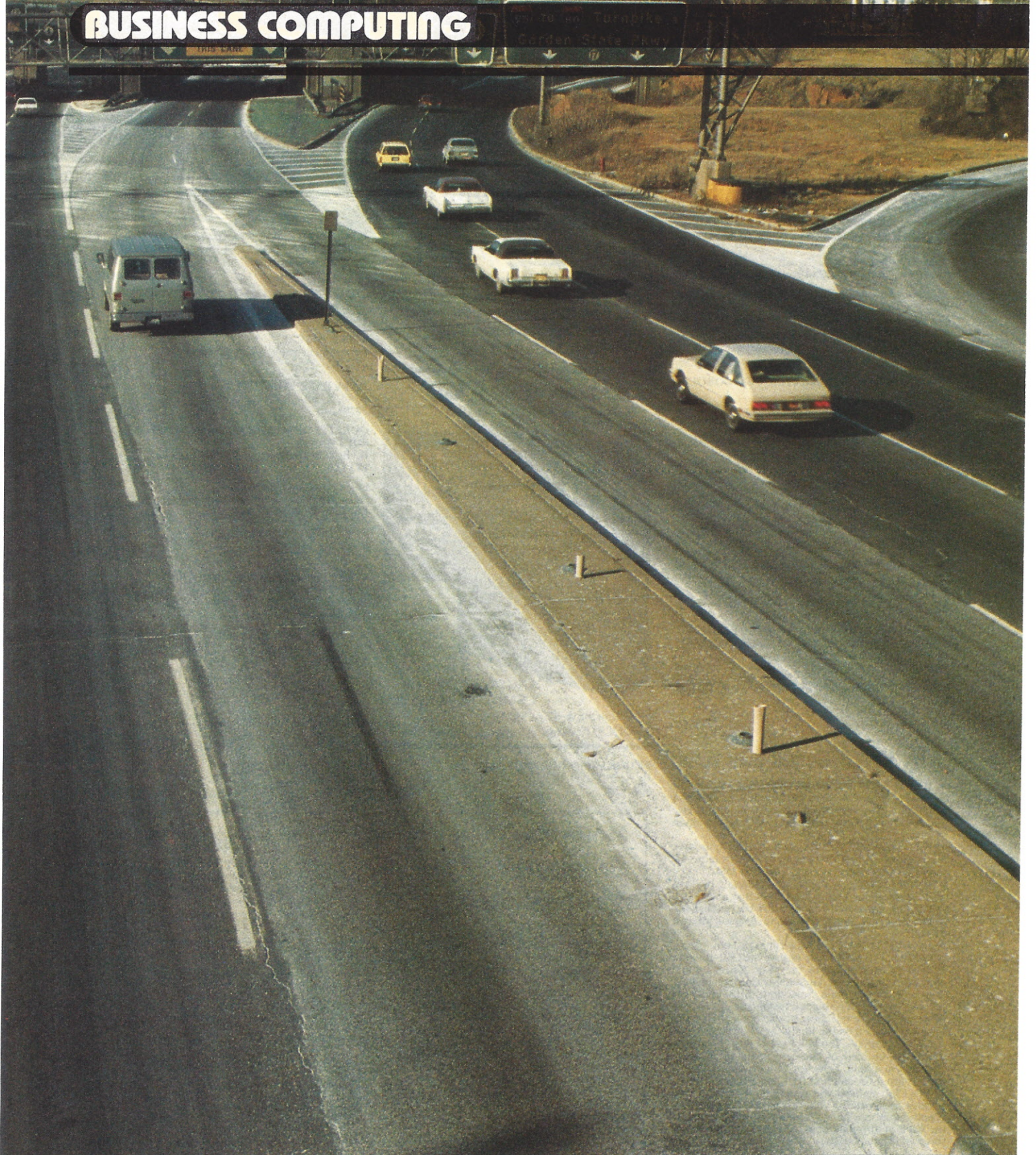


PHOTO BY KEN SCHROERS

Net greater profits with successful sales management

The road to successful sales is paved with good intentions, but too many deals can fall through the cracks. Now the personal computer can help you find your direction

Ziegler's, founded in 1904, is one of the pillars of Medina, Ohio. Selling both sensible and fashionable clothing for people of all ages, it represents all the independent, tradition-minded stores that can be found on Main Street, U.S.A.

But Ziegler's is not *too* tradition-minded. While the idea of computerizing the sales operation might have seemed alien to such a business a few years ago, Ziegler's has happily computerized and now won't look back.

The man who was instrumental in making the changes at Ziegler's is C. Jeff Ziegler, the treasurer, and a modernist who accelerated the methods of running the family company. Three years ago Jeff Ziegler began a low-key search through trade shows and sales outlets for personal computers. He wanted a straightforward, self-contained system that was not too expensive, and would help him get faster, more accurate control of sales information—and at the same time would “do as little internal changing as possible.” He feared that not all the sales personnel, who would

have to cooperate with him, would share his enthusiasm for increasing efficiency from day to day.

Ziegler soon got lost in all the available options for computer hardware. But he was distressed by the absence of ready-to-go software that was specifically designed to help retailers. Eventually he turned the challenge over to a local business-computer firm, Johnson Computer, which recommended the Commodore CBM 8000 as the primary piece, with a dual mini-floppy disk drive, the 2040 Tractor Printer and an offer to help out with the interesting matter of developing retail-specific software at a break-even price. The total cost for the installed hardware and software was under \$8000. Sold.

Ziegler has had the system running since January 1980. He tracks 20 departments, subdivided to 132 categories of goods. He also tracks the individual productivity of the year-round sales force of about 40, which increases to about 70 during the Christmas season. Each morning he gets a printout of these breakdowns for the previous day, further tracked

according to payment by cash, either of two credit cards the store honors, or the store's own charge accounts. For accounting and projections, the same results are easily tabulated monthly or on any other time basis.

In addition to the almost instant insight on detailed sales trends, Ziegler has found several derivative applications. He had expected an “input hang-up” that would make some of the possible uses of the system not worth the time, but in practice the applications have saved time.

By adding an accounts-payable program, for example, Ziegler no longer has manufacturers' invoices disappearing into a manual filing system, only to notice too late that early payment would have netted him a discount. An order, and its origins and conditions, can now appear on the screen or printout at the touch of a few keys.

With the addition of a letter-quality mailing program, obtained from CMS Software Systems in Dallas, Texas, Ziegler's conducts its own promotional direct mailings to charge-account holders and other ac-

tual and potential customers. When speaking of the computer system, Ziegler says, "We're tickled with it. It's gotten a lot more done for us in the last year than we've been able to do any other way."

Overhauls are needed

The Ziegler experience sets a good example for other retailers, whose everyday business is to provide goods to walk-in customers. But throughout the entire matrix of U.S. stores, and including the many thousands of companies selling products and services to other companies before a final product comes to the attention of the public, the recording and analysis of sales information is no less important.

The basic choice is should a cost-conscious company keep up a tried-and-true manual system for manipulating sales and planning information, or should it make the overhaul to a computer?

real estate, legal, accounting or medical practice, there's a personal computing set-up available today that will be ready to pitch in and help you with specific tasks. It still takes some prior computer learning or good advice about what goes best with what, but it's a lot easier now than it was when Ziegler first started looking for his computer equipment.

When selecting a personal-computer system for use primarily or at least importantly in sales management, it would be hard to go wrong with any of today's well-known machines. All but the simplest models meet the main criterion of expandability; personal-computer users often discover desirable new applications after they have their systems running for their original purposes. Choice of a system can be limited slightly, or greatly, when there is a need to accommodate specific ready-to-use software packages.

The choice of a computer system

lation and some fill-in work by a local programmer, the computer has been in charge of nearly all the important numbers for "Neighborhood Ranger," as Bullock's company is known to the public. Within a 60-mile radius of Austin, Neighborhood Ranger provides security patrols for residential and commercial subscribers; on-premises guards for apartment buildings, construction sites and the like; and a 24-hour nerve center to monitor the security personnel and automatic alarm systems.

"The machine keeps track of all this," says Bullock, who has delegated most of the computer operation to an office manager who handles it easily despite a lack of prior familiarity. "It's so good that I don't stay tied up with details at my desk any more, and I can run down the road any time I want."

Records of sales stay up to date now, Bullock states, and the ability to print out the current status of contracted services has given him a quick and clear agenda of receivables for the first time.

The computer has also solved a knotty problem peculiar to the trade: Part of Bullock's business is pre-wiring buildings under construction so that an alarm system can be fitted in after the building is complete. In the years before the computer, it was difficult to keep track of the stages at which certain parts of the wiring had to be done. Now the computer is an infallible prompter.

Although the single greatest value of the computer is that it helps International Protection understand "where the profit centers are and where they're not," Bullock says, the generation of sales leads is nearly as valuable. The computer not only prepares direct mailings to the established customer base and to new prospects, but keeps ongoing tabs on the results.

Back at the ranch

Bill Bottorff, meanwhile, devised an ingenious method for getting a Vector to help sell itself, as well as the other models he carries. Austin Business Computers has changed its

"We keep finding more and more ways to use the computer."

Big business made up its mind about this a long time ago, and there's not a sales manager in a large corporation who would do something irreversible while his computer is unplugged. But these days you don't need a mainframe computer to get the equivalent benefit for a company of modest size, or for a sales department of moderate size within a large organization.

Personal-computer manufacturers have progressively honed their basic equipment and peripherals to play whatever tune you want to hear: The cost of the hardware has decreased despite the more sophisticated performance. The manufacturers themselves have begun to compete with independent software suppliers in selling specific applications programs.

So whether you're in retail or wholesale or manufacturing, or in a

made by Frank Bullock, president of International Protection Corp. of Austin, Texas, was quite arbitrary. Bullock is in the security business, and some time ago he sold an alarm system to Austin Business Computers, which at the time was a sales office for Vector Graphic models. Bullock himself is the only salesman in his 60-employee company—a company with a highly complicated market structure. It occurred to him one day that one of the machines in the office of his new customer could help him keep track of sales and generate new business. It didn't take long for Bill Bottorff, head of Austin Business Computers, to sell him a Vector Graphic computer, plus a Qume letter-quality printer, Peachtree accounting software and Vector's Memorite III word-processing option, at a cost close to \$13,000.

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MATHPACK - global calculator/editor +, -, *, /, by another field or constant; null (remove contents) of a field or replace contents of a field with any word, number or phrase. Sum multiple fields in each record or running sum of single field in all records. Extract information or effect permanent change. Replace in the same field or place in a waiting field.

DESCRIPTIVE STATPACK - Determine MEAN, MEDIAN, MODE, STANDARD DEVIATION, VARIANCE, RANGE. Generate HISTOGRAMS from 1 to 25 steps, and produce Z-SCORE reports.

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CALCPACK - 2 way interface to VisiCalc or any user program. It lets you use VisiCalc for complex manipulation, editing, placing results in JINSAM for sorting, storing or moving data to WordPro as well as giving the ability for exchange with your own applications.

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to build JINSAM databases automatically. For example: You could "download" information on holerith cards to sequential files and INTERAC would place them into JINSAM files.

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name to The Right Stuff, and has added two personal-computer models and a minicomputer from the Hewlett-Packard line.

Armed with his mathematics education and long background in big-ticket sales, Bottorff challenged himself to get a tight grip on management of the "sales cycle," which is the process from identification of a potential customer on through analysis, proposal and negotiation, closing the contract, installing the system and getting paid. The cycle takes place over a period of weeks or months, and a sale can be stalled or even lost because the sales staff is too busy or inattentive to push from one phase to the next at the appropriate time.

So Bottorff wrote a program incorporating the seven phases of the cycle into a "state-transition matrix." Each of his six salesmen tracks his own sales load, letting him know when an individual prospect needs new attention and allowing him to project an aggregate of upcoming work in each of the needed sales phases. This helps the salesman achieve a desired level of sales over a given time period. Once a week, Bottorff loads the salesmen's floppy disks onto the hard disk of a Vector Graphic 3030, merges the data and prints out charts and graphs showing where the business stands and where it's going.

"The trick is to keep a potential sale from stagnating," Bottorff states. "You can miss a sale just because you forgot to call the customer back at the specified time. To avoid that, and to give me an all-around management-projection tool, this is a super-effective system." Bottorff also uses Memorite III software to prepare mailings to prospects.

Computer control needed

Among all types of business, residential real-estate brokerage would rate near the top in the importance management gives to fast, accurate sales information. General Manager Sven Jensen of Seville Properties in Los Altos, Calif., has computer access to the region's multiple-listing service (he uses a Texas Instruments terminal). He got out of a computer

time-sharing service two years ago because he wanted greater control and quicker access to the data generated by his own people. The solution: an Apple II Plus for the office.

When Jensen now closes each month's books, he has the tabulations within two hours, plus crucial cash-flow projections for the coming months—figures based largely on escrow closings. Jensen presently has 24 sales representatives, and he gets regularly updated reports on the current and previous year's sales results achieved by each. Costs and productivity "per desk" are also measured continuously. The computer tracks sold and unsold houses according to how many days they've been on the market, list price and any difference between list price and final selling price.

Jensen has put together a versatile system with software from Apple Computer and several independent software houses, plus the Applewriter package and Apple's Silentyte 440 printer for word processing. The word processing serves not only for letters but also for printing out contracts. It also aids Jensen's inclination to put communications in writing. He stores memos, and uses the computer to fire off a reminder memo to, for example, a sales representative who has repeatedly omitted a necessary paragraph in contracts. The mailing-list program stores phone numbers, addresses and even birthdays. Salesmen's licenses are kept current by storing and retrieving data for renewals.

This year Seville will computerize information on lenders' money resources for the creative financing needed for most of today's transactions. Jensen states that the same data will help him prepare a presentation for potential clients, demonstrating that his agency is capable of high performance. "The list goes on and on and on," Jensen says. "We keep finding more and more ways to use the computer."

On a much larger scale and greater geographic scope of operations, Bob Caffey is also a real-estate man who couldn't conceive of a successful sales

operation without a computer. He is vice president for internal operations with Realty Income Corp. (RIC) of Escondido, Calif. The company develops and syndicates commercial properties throughout the U.S. on the principle of "no debt, no speculation," says Caffey. There is no room for slackness in his sales management.

RIC's non-speculative customers are individual establishments as diverse as child-care centers, racquetball centers, fast-food restaurants and entire shopping centers, for which the tenants are lined up well in advance. RIC avoids debt by marketing shares to income-oriented investors, primarily through a network of 2000 brokers and securities dealers all over the country. He then goes to construction contractors after the capital is committed.

No room for slack

"We couldn't do without a computer to track so many outlets," Caffey says. "Speed in digesting and retrieving information is crucial to us."

The tracking operation is complex enough that RIC installed an Altos ACS8000-7 personal computer with 29 megabytes of hard-disk and floppy-disk storage with magnetic tape backup. He also installed two printers and four terminals that are kept busy by seven or eight people. The data base includes detailed profiles of each member of the sales network and geographic coding for the benefit of area sales managers. The output tracks either aggregate sales volume or sales volume according to any of several desired breakouts.

RIC has not missed the convenient opportunity to automate its sales correspondence. Through two software packages from Micropro International—DataStar for database sorting and updating and WordStar for word processing—RIC can now routinely send letters and promotional literature to all of the 2000-plus salesmen and agents simultaneously. In the old days, until about March 1980, correspondence was such a burden on the staff that only the most important information

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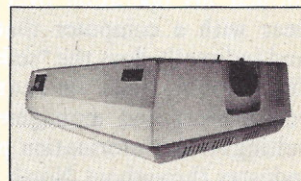
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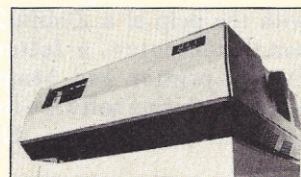
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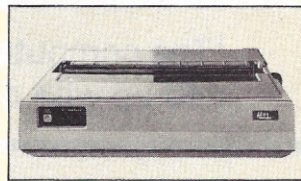
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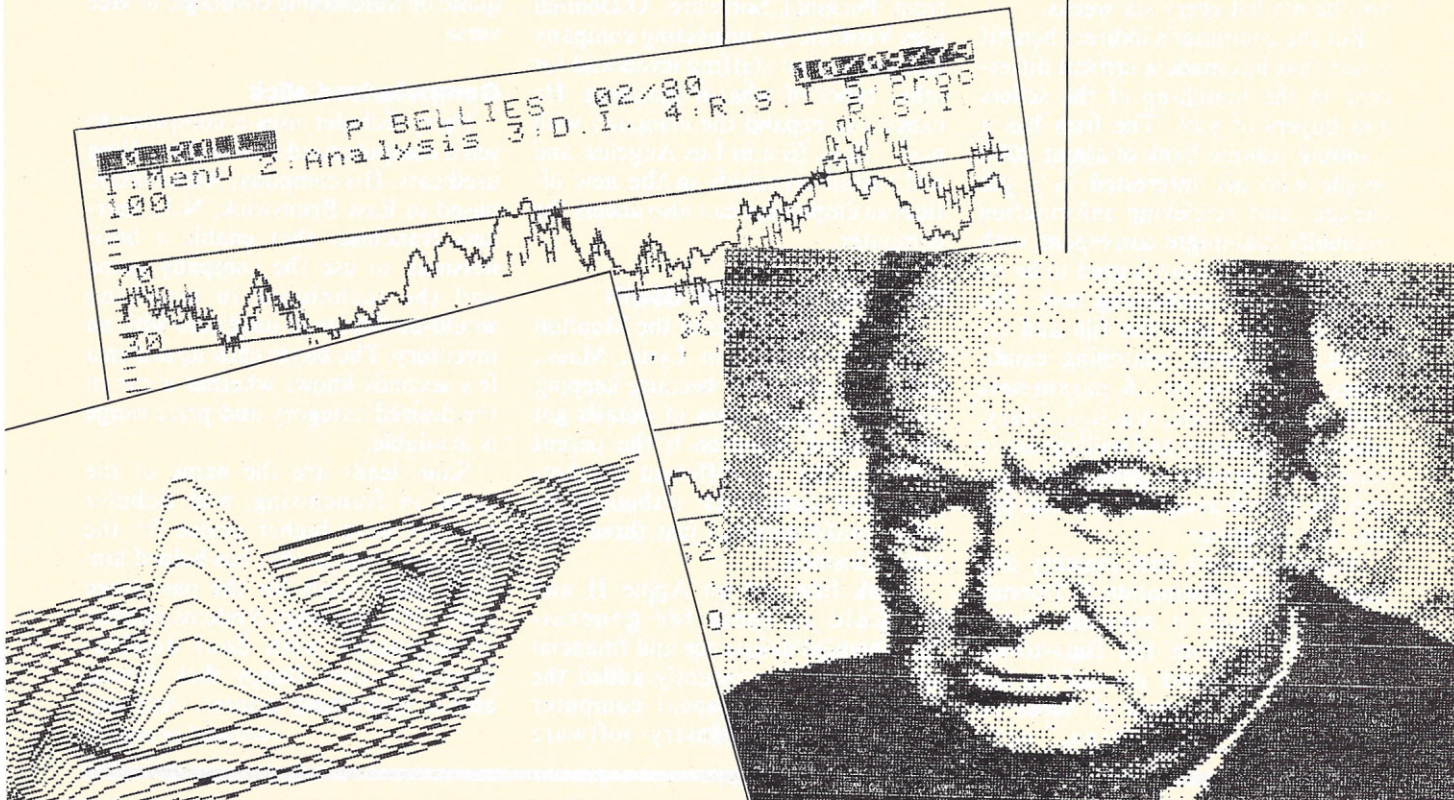
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would go to as many as 200 addresses at the same time.

Stored-search data

Jobs and people are the products of O'Donnell & Associates in Neptune, N.J. Dennis O'Donnell has transformed his operation over the past year with a computer that directly and indirectly does the "selling." The firm specializes in search-and-recruitment and management consulting for the information processing industry throughout North America.

The direct selling is accomplished with the help of a Zenith Z-89 personal computer, a letter-quality Diablo printer and Magic Wand word-processing software from Small Business Applications. Using this

O'Donnell. "The client is very happy to get the new employee in a much shorter time than he imagined. We're sure happy to reduce our time and cost in fulfilling the search. Naturally the candidate is happy to get the new job."

Centralized computerization has long been the practice for the large, multibranch recruitment companies, but in O'Donnell's view it has become indispensable even for relatively small, single-location firms with annual billings under \$1 million. "The knowledge of who we can get, and where, how to get him and when, is priceless," O'Donnell states. "Just one fee earned will more than cover the price of the computer."

O'Donnell says his hardware and

which was modified to meet his precise needs. While the Apple stays on purely financial duty, Clark has been using the Durango to improve his grip on sales data and sales performance.

The Durango computer breaks out monthly sales results according to the type of policy sold, its proportion of the total product package, and which Moulton company and salesman are responsible. "These are very valuable tools for knowing who is writing what and in what fields," Clark says. "For example, if a salesman has been writing a lot of auto policies that don't bring in much income, I can show him the printout and ask him to concentrate on something more profitable next month."

With Durango-supplied word processing, Clark has standardized his sales letters. He has the option of incorporating any of several blocks of information into several parts of a letter in support of a particular policy. He has also made it a standard practice to include sales messages on invoices. A homeowner receiving a bill for the premium on fire-and-burglary coverage, for example, will be informed that Moulton will be happy to quote on automobile coverage, or vice versa.

Computerized slick

Barry Schuler uses a computer to sell a computerized system for selling used cars. His company, AutoMatch, based in East Brunswick, N.J., markets franchises that enable a businessman to use the company name and the techniques in matching would-be buyers of used cars with an inventory. The buyer calls up and in a few seconds knows whether a car in the desired category and price range is available.

Sales leads are the name of the game in franchising, and Schuler couldn't have higher praise for the computer system that has helped him track these leads for the past three years. It's a Prodigy Systems personal computer with dual double-density, 8-inch floppy disk drives, and a high-speed printer. Applica-

continued on page 61

"The computer is so good that I don't stay tied up with details at my desk any more."

equipment, the company can systematically market its services to the industry. Letters to prospects can also be mailed every six weeks.

But the computer's indirect benefit is one that has made a critical difference in the match-up of the sellers and buyers of jobs. The firm has a standing resume bank of about 2000 people who are interested in a job change, and retrieving information manually that might correspond with a commissioned search used to be an unwieldy, time-consuming task. The Z-89 can now scan the file and retrieve, in seconds, matching candidates according to 16 parameters such as current title, function, salary, education, location and willingness to relocate. Information gained during a specific search assignment is also put into the computer.

The computer's fast mastery and generation of information, O'Donnell says, has made it possible to cut search time from the four-to-six months considered normal in the industry to an average of about 90 days. "Everybody wins," says

software configuration cost under \$10,000 and included some fringe benefits such as a VisiCalc package from Personal Software. O'Donnell uses VisiCalc for projecting company income against staffing levels and for other types of what-if planning. He expects to expand the company with new offices, first in Los Angeles, and will install terminals in the new offices so employees can also access the computer.

Don't die the detail death

Al Clark Jr., owner of the Moulton Insurance Agency in Lynn, Mass., also got a computer because keeping track of a great mass of details got out of hand. Moulton is the parent company for 10 different market-insurance companies, although the whole outfit employs just three full-time salesmen.

Clark first got an Apple II and VisiCalc as tools for general-management assistance and financial analysis. He has recently added the Durango F-85 personal computer with insurance-industry software



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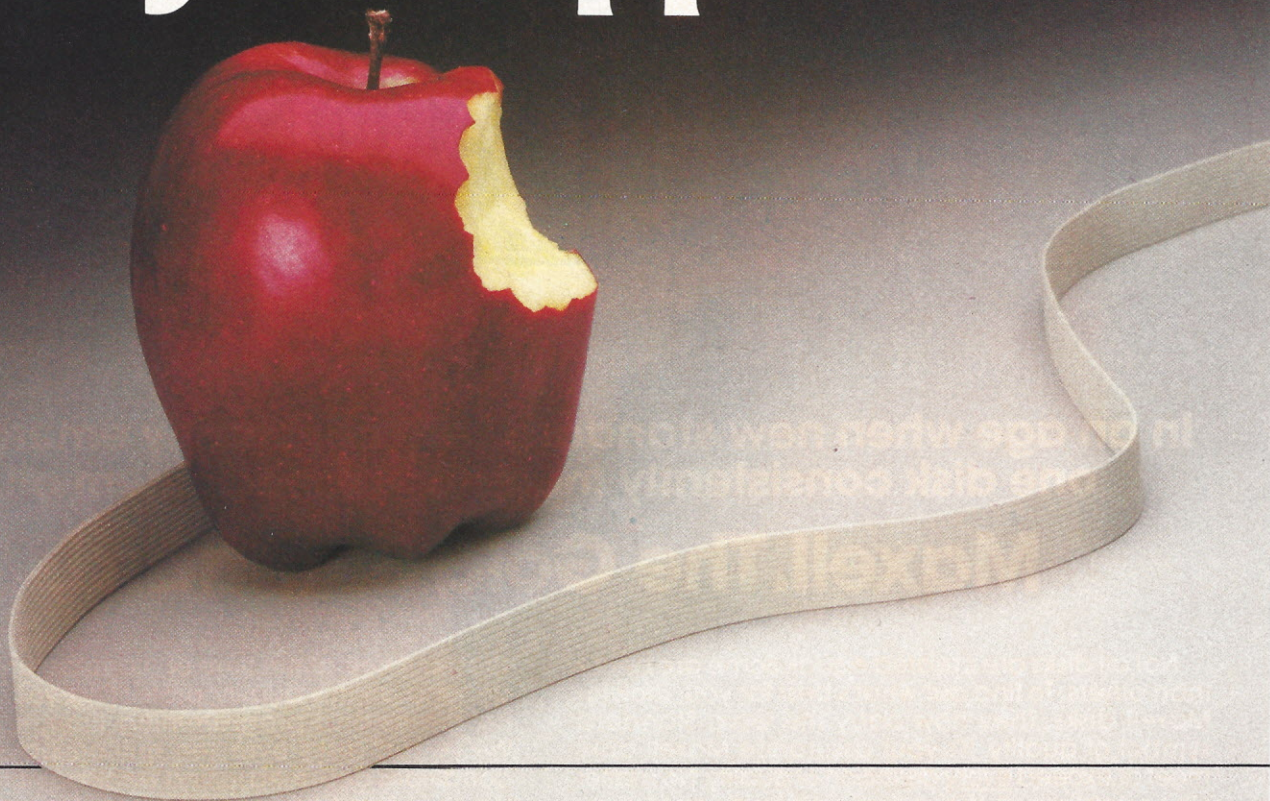
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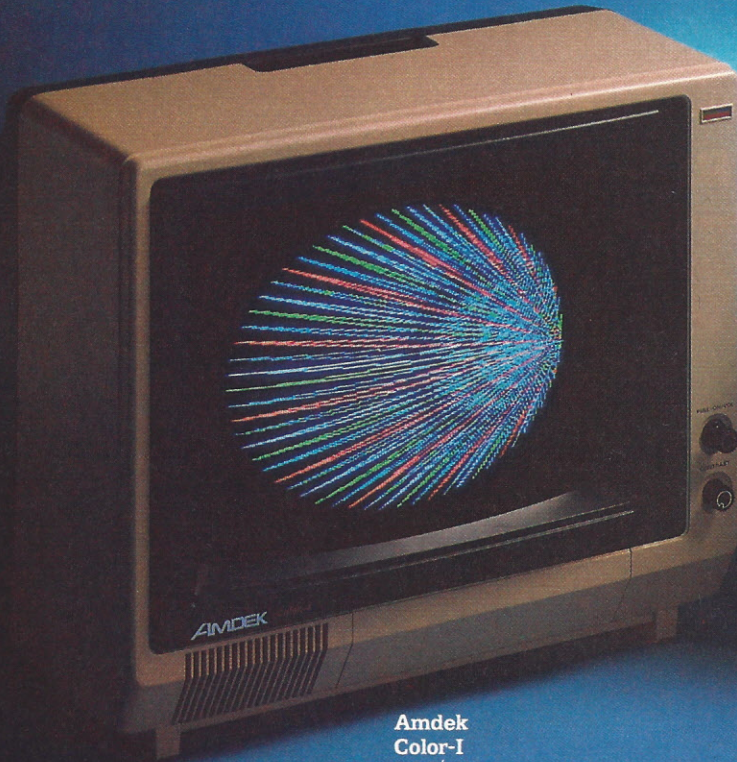


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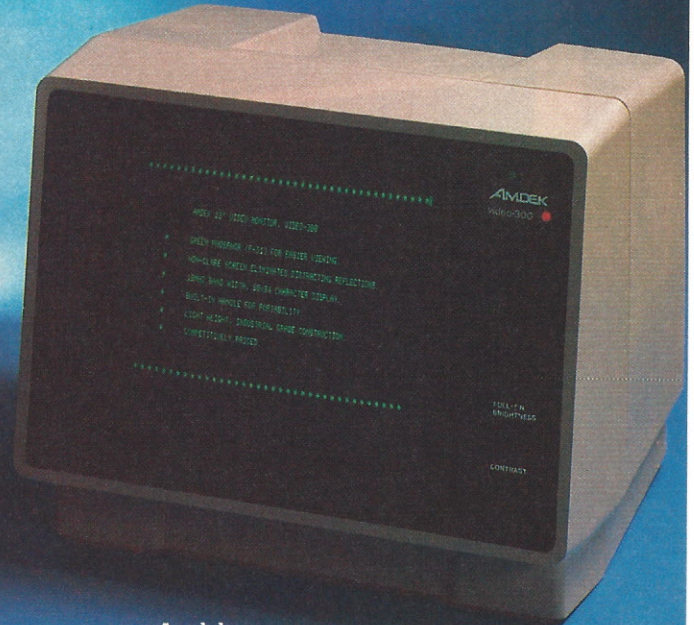
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Sales management

continued from page 56

tions software is compatible only with Prodigy's operating system, but the interfacing of packages plus the speed obtained by "data compression" gives Schuler what he considers to be an ideal compromise between a personal computer and a minicomputer. The cost of the system at the time of installation was \$12,500.

Schuler categorizes and stores information about franchise applicants according to actuarial data, Auto-Match's impressions on first contact, and the very important matter of where the contact came from—advertising in any of several media, for example. Schuler puts the computer in control of the agenda for negotiations, such as being certain a first query is answered within two weeks, and that if nothing else hap-


pens soon after, the lead is pursued by telephone at the right time.

Ease the change

Breaking in a computer to help out with sales management can have pitfalls, just as a changeover from one accounting system to another can have figures up in the air and people scratching their heads for a while.

To minimize the transition process, sales chiefs generally advise against being too impatient on the day the computer is plugged in—Dennis O'Donnell, for example, found three weeks to be an excruciatingly long time to have his resume data in a "no-man's-land" between manual files and computer disk. Some first-time computerists make the mistake of either buying equipment that can't be expanded enough to meet later

needs, or buying the right equipment for the moment without budgeting for expansion.

The end benefit of computerizing a small- or medium-sized sales operation, says Jeff Ziegler after his changeover in a small-town department store, is that "if you'll put darned good information in, you'll get darned good accounting back out. Personal computers can do more things at relatively inexpensive prices than the big computers used to do. Smaller businesses should start thinking about this—if they haven't already." 

Californian Ken McLamb is a freelance business writer. His days are spent with his hands on the keyboard and his ear to the ground of the personal-computing movement.

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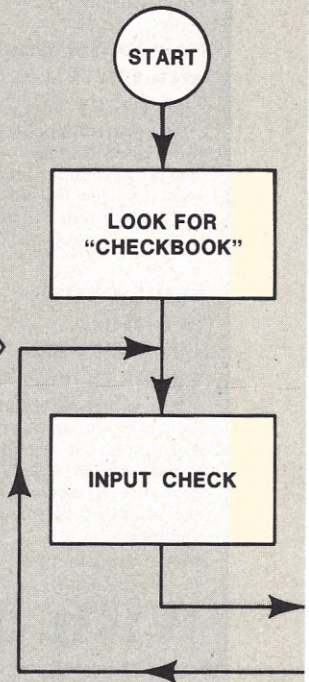
Programming isn't restricted to coding, but consists of a series of steps that begins with deciding what the computer is to do (below left). The programmer then may flow-chart the logic (center), and finally the program is coded (right).

CHECKBOOK CONCEPT

I WANT THE COMPUTER TO:

1. FIND DATA LABELED "CHECKBOOK" ON DISK
2. GET CHECK FROM USER
3. ADD CHECK INFORMATION TO "CHECKBOOK"
4. SEE IF I'M DONE
5. IF NOT, GO TO STEP 2
6. QUIT

ALGORITHM



Editor's note: Make no mistake. Computers are here to stay. They manage our businesses and our homes. With a little help from Congress, our kids will be computer literate upon graduation from high school. And at every corner we turn, we encounter new uses for our computers.

Yet when many people hear the word "programming," they get palpitations. This need not be the case. Programming is to computing what composing is to music. There are a few fundamentals to learn before you compose the tune.

The point is this: If we don't learn how to program, we'll program ourselves right into obsolescence.

Hence, this three-part series, intended to educate those who as yet do not know how to program, and to refresh those who do.

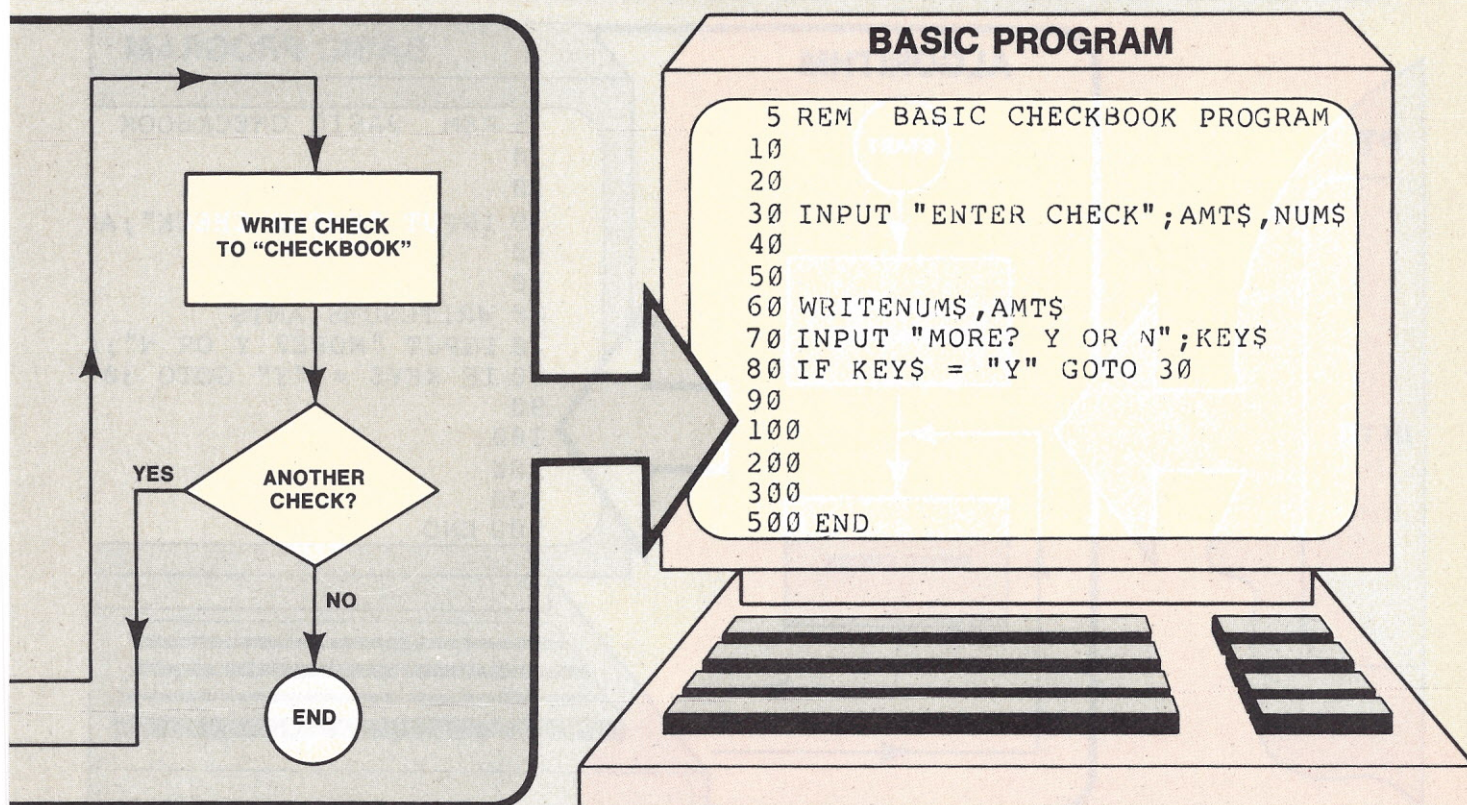
Contrary to popular belief, computers are not bringing about the first information revolution that civilization has ever seen. The mass development and use of language, mathematics, books, telegraphy, radio and telecommunication have all permanently reshaped society. In each of these instances, the people who educated themselves about the important communication media of their time benefitted the most from significant technological changes. Most people will agree that things are changing more quickly these days, and computers are one of the contributing factors to this change.

A more general term for the ability of a person to make efficient use of available media is literacy. In the early part of this century, a person who could read, write and perform

basic arithmetic was considered literate. This definition is no longer true. As the computer-based information revolution sweeps through our society, so must an extended definition of literacy.

Many of the businesses and occupations that will thrive over the next 10 years will be those under the direction of people who are computer literate. An excellent illustration of this is provided by the accounting field. Many businesses are using personal-computer systems in place of accounting services, but this does not necessarily mean that accountants will be put out of work. Many accountants are investing in personal computers to expand their services.

No field is inherently endangered by society's use of computers. Those who remain ignorant of computer technology, though, will be in serious



danger of losing their jobs or businesses, because computer literacy is becoming every bit as important as is the traditional literacy.

You don't have to become a computer scientist to be computer literate. Likewise, it is not necessary to be a linguistic expert or a mathematician to be proficient in the three "Rs." Computer literacy is simply the fundamental knowledge of how computers work and the ability to read, write and analyze simple programs.

Programming is the primary component of computer literacy. But computer mechanics and programming are so deeply intertwined that it is important to first understand exactly what a computer is and how it works.

Computers are simply information processors. No computer does anything more than obtain information from its environment, process that information and provide the results of

the processing. These functions are often called input, processing and output, and each of these functions is performed by a separate computer device.

People as processors

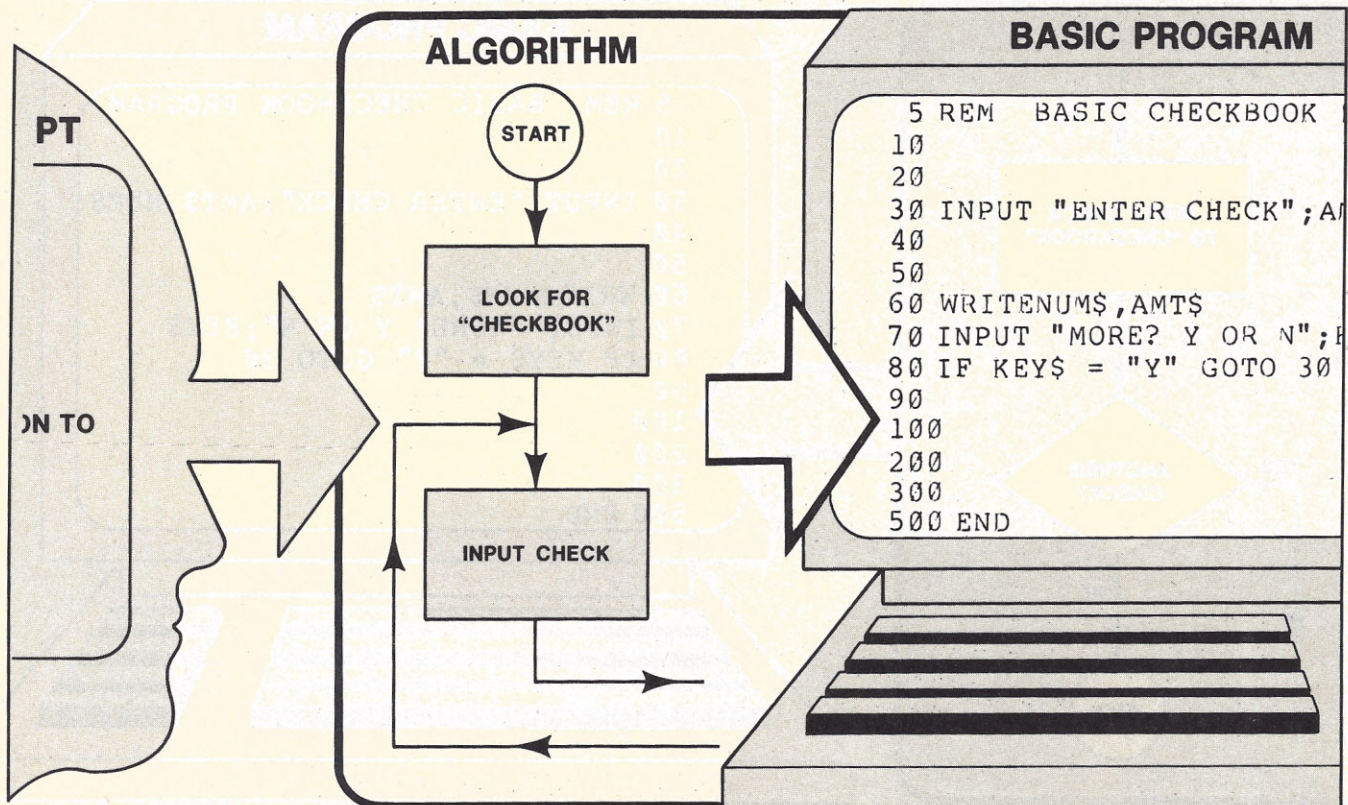
Information processing is not limited to computers. In a very fundamental sense, people are also information processors. We receive information, analyze it and distribute it through written or verbal expression.

Although human information processing is not well understood, it is known that people make use of some very basic cognitive devices. While parts of our brains are devoted to thinking, other parts seem to be used mainly for long- and short-term memory. Long-term memory is used for permanently remembering large amounts of information such as one's native language. Short-term memory is used for temporary retention of small bits of information like new

phone numbers. Sometimes our brains receive too much information and we make use of paper and pencil as an external memory device.

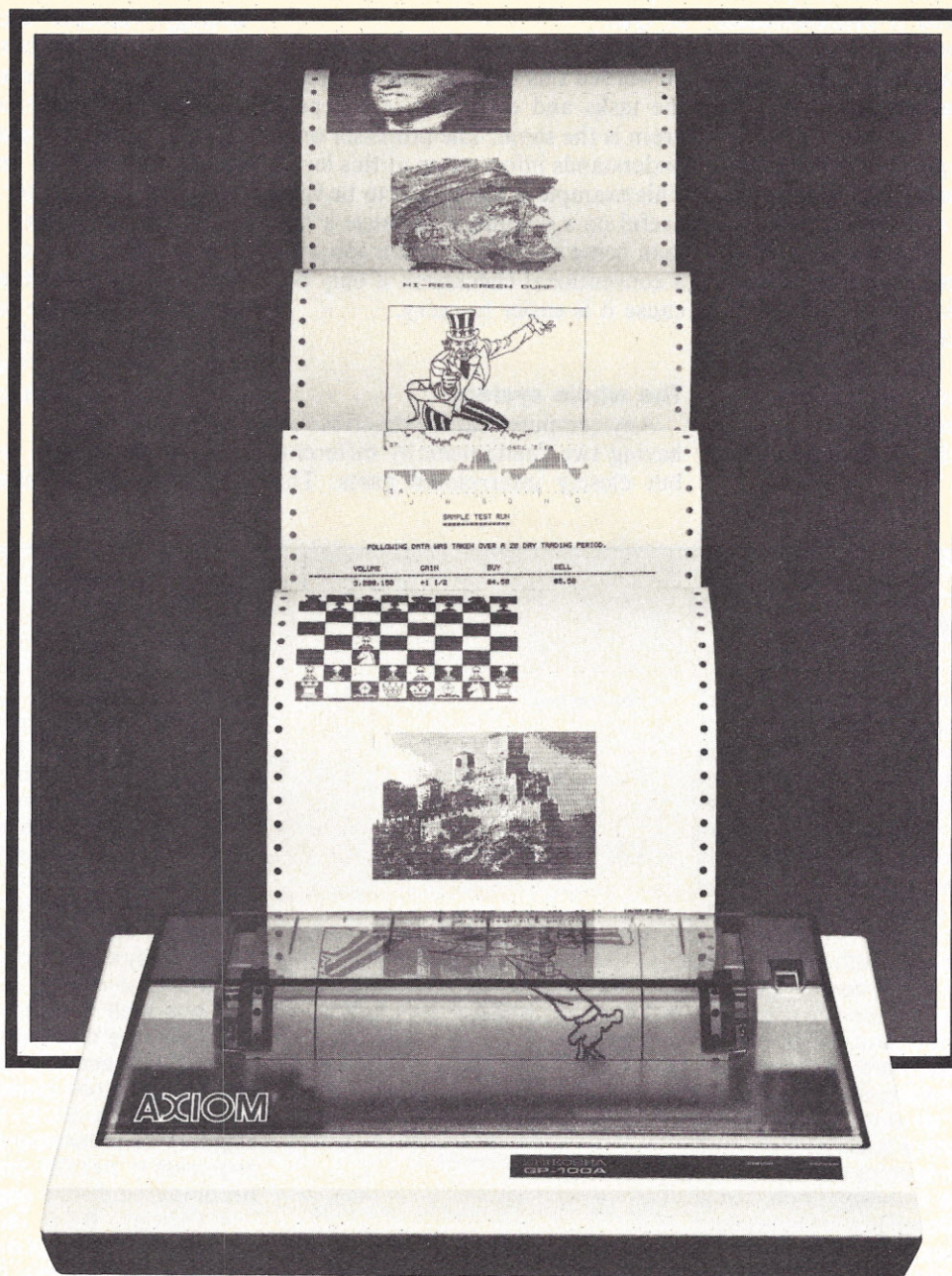
Analogous to our senses, type-writer-like keyboards are the primary input device for most computers. The computer's processor manipulates input from the keyboard, and sends the output to display devices such as video screens and paper printers.

The computer's processing unit consists of a processing chip which is capable of very crude "thinking," a bank of internal memory chips, and external memory devices such as a disk drive and floppy disks. The processor can move data to and from all the other devices, and perform simple arithmetic and logical operations with this information. The internal memory consists of some read-only memory chips (ROM) and a relatively large amount of read/write chips called random-access memory (RAM). *continued*



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These two groups of memory chips are analogous to long and short-term memory, respectively. Just as human information organs are connected to the brain through nervous tissue, computer components are connected to the processor with wires. Although the processor is the smartest part of the computer, and it communicates with other computer devices and performs simple mathematical operations, a \$10 calculator can do the same thing.

The advantage a computer has over a calculator is that a computer can memorize a virtually limitless combination of simple instructions. Programs can be created by conjuring up a list of instructions for some task, like balancing a checkbook. The processor stores those instructions in memory and reads and performs each instruction in sequence.

Here's what the list of instructions might look like:

1. Find the data labeled 'Checkbook' on the disk.
2. Get check from user
3. Add check information at the end of 'Checkbook'
4. See if user wants to quit
5. If user doesn't want to quit, go to step two
6. Quit

The program would not necessarily be worded this way, but the nature of the tasks and each step in the program is the same. The processor only understands information at this level. This example is too simple to be very useful on a computer, because a human being might do a better job with a conventional checkbook if only because it is easier to carry.

The whole system

Any computer can be described as having two fundamentally different, but closely interrelated parts. The

hardware component consists of all the mechanical parts of the computer, and the software component consists of the instructions and programs that drive the hardware. In the human-being analogy, the hardware corresponds to physiology, while software is similar to knowledge and psychology. Another useful analogy is the relationship between written music and instruments. Musical compositions are really lists of instructions for playing instruments. Programs are lists of instructions for "playing" a computer.

Before forgetting the hardware and learning how to program, it is necessary to understand how the software and hardware interact. How is it physically possible for a string of information like "Get check from user" to be understood by a box of chips and wires?

Communication with computers occurs at several different levels. At

Computer codes

Binary numbers are the "words" that the computer understands. But for many reasons it is often more convenient to represent data in another way. When data are represented in a form other than binary numbers, the representation is called code, of which there are several in use in the computer world.

The two codes with which users will become most familiar, simply because they are used so commonly, are ASCII and BCD. ASCII (American Standard Code for Information Interchange) is the standard for almost all data transmission from computers to peripherals, and between computers themselves.

ASCII is a seven-bit code, but is frequently stored in a full byte (eight bits) and thus, is often called 8-bit ASCII. The full code set (see table) contains 128 characters. They include all the decimal numbers, the upper- and lowercase letters, and

4-1. ASCII Code Chart

Function code								Letter Code (exclusive of SP and DEL)							
								0	0	0	0	1	1	1	1
								0	0	1	1	0	1	1	1
								0	1	0	1	0	1	0	1
b7	b6	b5	b4	b3	b2	b1	NC	0	1	2	3	4	5	6	7
0	0	0	0	0	0	0	0	(NULL)DF1	SP	0	0	P			p
0	0	0	0	0	0	1	0	(ISOH)DC1	1	1	A	0	A		q
0	0	0	0	0	1	0	1	(STX)DC2		2	B	R	H		r
0	0	0	0	1	0	1	1	(ETX)DC3		3	C	S	C		s
0	0	1	0	0	0	0	0	(EOT)DC4	5	4	D	T	d		t
0	0	1	0	0	0	1	0	(ENO)NAK	6	5	F	U	u		u
0	0	1	0	0	1	0	1	(ACK)SYN	8	6	F	V	v		v
0	0	1	0	1	0	0	0	(BB)DF0		7	G	W	w		w
1	0	0	0	0	0	0	1	BS	CAN	1	8	H	X		x
1	0	0	0	0	0	1	0	HT	EM	9	1	Y			y
1	0	0	0	0	1	0	0	FS	SR		2	Z			z
1	0	0	0	1	0	0	1	VT	FISC		K	L			l
1	0	0	0	1	0	1	0	FS			L	J			j
1	0	0	0	1	0	1	1	CR	GS		M	I			m
1	0	1	0	0	0	0	0	HS			N	A			n
1	0	1	0	0	0	1	0	SI	US	7					u

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the highest level, there are general tasks the computer can perform like "Computer Payroll." Below this there are levels of increasing detail until, at the bottom of things, one can manipulate the computer by stimulating it electronically. At each of these levels it is possible to communicate with the computer in different ways.

The processing unit is the device with which the computer user communicates. The input and output devices merely serve to facilitate this communication. All information is transmitted, processed and stored as high and low electrical voltages, which are easily sent through wires

and the internal circuitry of the silicon chip that is the computer's central processor. People represent these high and low voltages as 1s and 0s respectively. By doing this people can use binary mathematics instead of digital electronics to visualize the internal workings of the computer.

Our numbering system is based on 10, using the digits 0 through 9. It is also possible to have a mathematics system based on only two digits (0,1) and to perform the same operations that can be done with a 10-based, or decimal system. Thus by cleverly designing digital circuits, high and low voltages can be guided so that they

result in binary mathematical operations such as adding, subtracting and so on.

It is even possible to perform logical operations involving decision making. "True" can be regarded as 1 and "False" as 0. Using numbers to represent letters, as is possible in any numbering system, even text can be represented by 1s and 0s. Thus it is possible to represent any type of information using combinations of 1s and 0s. Those combinations are called binary strings.

Processor functions

Memory chips are designed to effi-

Alternate number systems

We use a number system based on 10 digits. This is probably because we have 10 fingers. The 10 digits, zero through nine, are convenient to use because each of the digits represents one of the fingers. But it is conceivable that if we had fewer or more fingers, we would use numbers that have a base other than 10.

Since computers don't have fingers on which to count, they are not constrained to the 10-digit system. The only thing a computer can sense is the presence or absence of some signal. To put it another way, the computer only knows if the switches that make up its memory are open or closed. (A transistor used as a memory element in any modern computer is being used in a switching mode.) Since a switch can have only two states, open or closed, it makes sense for computers to use numbers based on two, instead of numbers based on 10.

Such numbers are called binary numbers. The only digits allowed in a binary number system are 0 and 1. The value of any number in a binary number system is determined by the position of the digits, just as it is in the decimal number system. For example, the number 1000 (base 10) means there are 0 units, 0

tens, 0 hundreds and 1 thousands. We look at the number and automatically perform the addition:

$$\begin{array}{r} 1000 \\ + 0 \\ + 0 \\ + 0 \\ \hline 1000 \text{ Answer} \end{array}$$

Notice that each of the number's digit positions is really a representation of a power of 10. Thus a digit in the units position is really a symbolic representation for that digit multiplied by 10 and raised to the zero power (which equals 1), a digit in the tens column means that digit multiplied by 10 and raised to the first power (10), a digit in the hundreds column represents that digit multiplied by 10 and raised to the second power (100), and so forth.

The same system works with numbers based on two. For example, the digit 100101 can be represented like this:

$$\begin{array}{r} 100000 \\ + 000000 \\ + 000000 \\ + 000100 \\ + 000000 \\ + 000001 \\ \hline 100101 \text{ Answer} \end{array}$$

In this case, each of the digit positions means the digit in that

position multiplied by a power of two, like two raised to the second, third or fourth power. So the number 100101 is:

$$\begin{aligned} 1 \times 2^5 + 0 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 \\ + 0 \times 2^1 + 1 \times 2^0 = 37, \text{ or} \\ (1 \times 32 + 0 \times 16 + 0 \times 8 + 1 \times 4 \\ + 0 \times 2 + 1 \times 1) = 37 \end{aligned}$$

A computer operating on straight binary numbers would "think" of 100101 as the same quantity we know as 37.

Binary numbers aren't the only ones used for number representation in a computer. Others are used for easy representation or storage at different times in the computation cycle. Two of the most popular representations are octal, based on eight digits, and hexadecimal, based on 16.

In the octal system, there are eight digits, zero through seven. But hexadecimal (hex for short) numbers use 16 digits, zero through 15. The decimal number system has no digits for numbers greater than nine, and must use two digits for larger numbers. So the letters A through F are used in a computer to represent hex digits 10 through 15. Octal and hex numbers are encoded and decoded to binary or decimal numbers as required.

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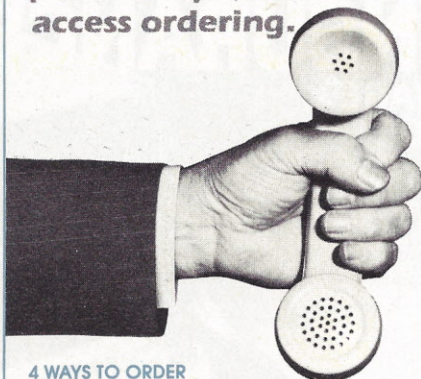
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ADVANCED COMPUTING

ciently store binary strings. The processor, however, is a bit more complicated. It has the capability to put binary strings into memory, pull them out of memory, perform logical and mathematical operations on them and remember a limited amount of information.

In addition to these capabilities, the processor understands a simple set of binary instructions. If a user wanted to program the computer with binary numbers, he could stop right here and start programming, but that would entail analyzing pages of 1s and 0s.

The set of binary instructions that a processor can interpret (the 1s and 0s) is called machine language, and each type of processor has a unique machine language. To avoid programming in machine language, an assembler is used. An assembler is a program written in machine language for code that translates a set of simple one-word commands into their binary counterparts. This means that a program can be written using English-like words, and the assembler translates them into the processor's machine code.

Using an assembler is an excellent idea, but unfortunately, assembly language is still fairly cryptic. People

don't think one word at a time, but rather in sentences and paragraphs. It is possible, however, to write a program in assembly language that reads programs in an even higher-level language and translates them into machine language. Such programs are called compilers, and they make communication with computers in a more English-like language possible.

Every computer language has a compiler. There are Pascal compilers, COBOL compilers, FORTRAN compilers, etc. Another type of compiler that translates programs while they are being executed is called an interpreter. Most personal computers have a BASIC interpreter programmed into a set of ROMs.

Acting as a foreign language dictionary, these ROM chips translate BASIC statements into machine-language instructions. Whenever the processor receives a program statement, it consults the BASIC ROMs to find out what to do. Since an interpreter ROM can turn each BASIC statement into several machine-language commands, while each assembly-language statement is translated to one machine-language statement, BASIC is called a high-

level language. Other high-level languages are FORTRAN, COBOL and Pascal, to name but a few.

While these other high-level languages are all available for personal computers, they usually come only as options at extra cost. So most people starting out with personal computers will be confronted with BASIC as the machine's resident language. Thus, we will use BASIC throughout this series of articles to illustrate fundamental programming principles.

Giving instructions

When programming in BASIC, there are two ways to give the computer instructions. A user can give the computer a numbered list of statements that make up a program, and the computer executes the whole program, or a user can give the computer a single statement that is executed immediately.

The BASIC language consists of a set of statements which is considered its vocabulary, and each statement has an entry in the ROM dictionary. Some of these statements can be interpreted as immediate commands, but most of them can only be used as elements of a program.

It is important to note that there

continued on page 96

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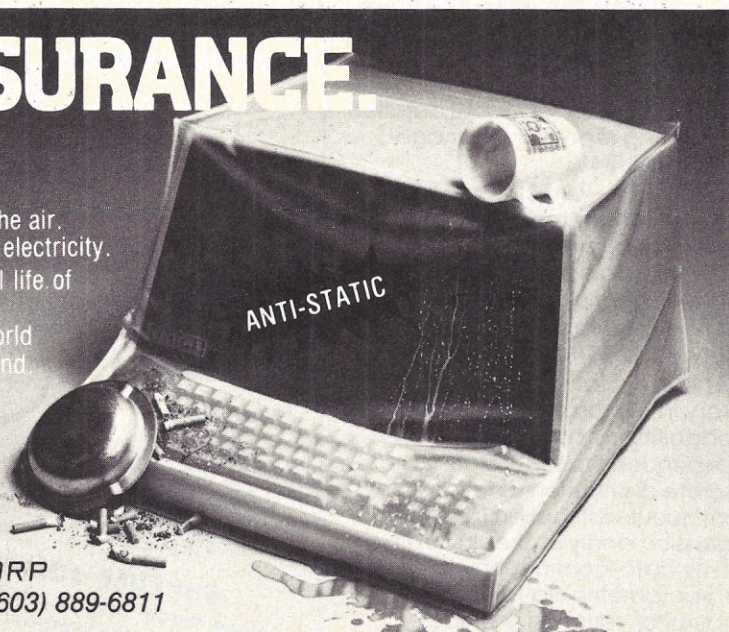
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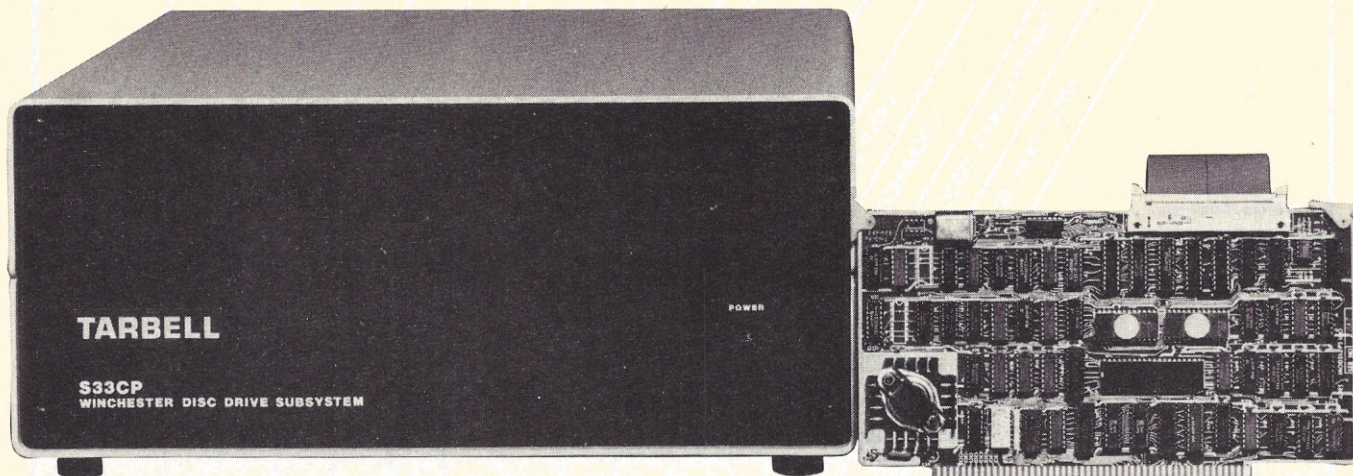
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Single-sheet feed	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Continuous forms		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Multiple copies		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Any page from file			•			•	•	•		•				•	•		
Simultaneous I/O spool			•							•		•		•	•		•
Change print position										•				•	•	•	
Column shifts						*				•		•		•	•	•	•
Change vertical pitch						*	•	•		•		•		•	•	•	•
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Change fonts			•			•	+	•	•	•				•	•	•	•
Global output																•	
Line/form feed			•			•	•	•		•		•	•	•	•	•	•
Print from any page			•			•				•		•		•	•	•	
Stop pagination			•							•	•			•	•	•	•
Red ink printing										•	•			•	•		
Multiple overstrikes						•		•		•	•	•		•	•	•	•
Bidirectional printing#			•			•	•	•	•	•	•	•	•	•	•	•	•
Pause character			•							•	•		•	•	•	•	•
Skip addresses in print													•				
Unformatted printing		•	•			•											•
Micro space shifts							•	•		•				•	•	•	•
Print "copy" on copies		•															
Replace character			•			*				•			•	•	•		
Overstrike character						*				•				•	•	•	•

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+ If printer will allow and software is modified.

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Word processing: the A to Z of software

The choice between a typewriter and word processing with a personal computer is obvious. Less obvious is the right software choice

Certainly one of the most useful applications software packages is word processing. It seems almost everyone has the need at one time or another to use the typewriter. If a personal computer is available, the choice between the two machines is obvious.

Not only is the computer faster and more efficient than a typewriter, but word-processing software is not very expensive. So potential users get a real benefit from personal-computer word processing, and the incremental cost is relatively low.

But what is a word processor, and what are the features of a word processor that people should look for as they shop?

There are basically two kinds of word processors. There are dedicated word processors, and there are word-processing packages for personal (and other) computers. The dedicated word processors have functions that can make them a dream to use as word processors, but that's all they can do. For example, they can't run VisiCalc.

The software packages for personal computers make them good word processors, but since the software is running on machines on which word processing is not the primary function, they have to make some compromises. They may, for example, use a sequence of key strokes to accomplish some function, instead of having dedicated function keys for the same purpose. The word processor on which this paragraph is being written uses control-D, as a case in point, for de-

leting characters or words, while a dedicated word processor might have a key that just deletes.

The features that a word processor should have actually depend more on what the user intends to do with the program than any other factor. Lawyers, for example, will need to prepare long legal briefs that could run several pages, and at the same time they will need to write one-page letters to their clients. Professional authors will need a processor that allows them to work on long, segmented documents, but they probably won't need a mailing-list package that works with the word processor. The ability to work on long versus short files could be considered global, or having to do with the way the word processor interfaces with the host hardware.

There are also features that are part and parcel of the operation of the package. They can generally be divided into editing, formatting and printing features, and most of them are self-explanatory. Still, there are many terms with which the user must become familiar if he is to be conversant with word processors.

The best way to gain the necessary familiarity is to visit a computer dealer and discuss word processing with him. In that way, the packages can be demonstrated and their features can be discussed.

Make sure that once the packages' features are known, you study the way you actually work (not the way you wish you worked) to get the inventory of features you really need. Word-processing packages are available at almost any price, with un-

believable combinations of features that should suit anyone in the market for a word processor.

Clear and professional

Beyond the basic features you determine you must have for your type of writing or word processing, the value of a word-processing program depends on its documentation and ease of use. Fortunately, most software houses have readable and useful user's manuals. By and large, they are clearly and professionally presented, and give many examples and "how-to" steps for each function.

The best word-processing package for you is not necessarily the one with the greatest number of features. After all, some features may be unnecessary, while other needed features may be lacking, no matter how all-encompassing the package seems. The choice must depend on what is to be done with the package, and how.

Editing features from which everyone may benefit include: four-way cursor movement; character, line and block (or paragraph) insertion and deletion; vertical forward and backward line scrolling on the screen; and copying, moving and merging blocks or paragraphs. Other beneficial features are: search and find, and search and replace characters or character strings; and smooth document recovery from crashes. This recovery is crucial to avoid frustrating loss of a document due to unavoidable causes like static electricity.

Standard formatting features—those which put a document into the

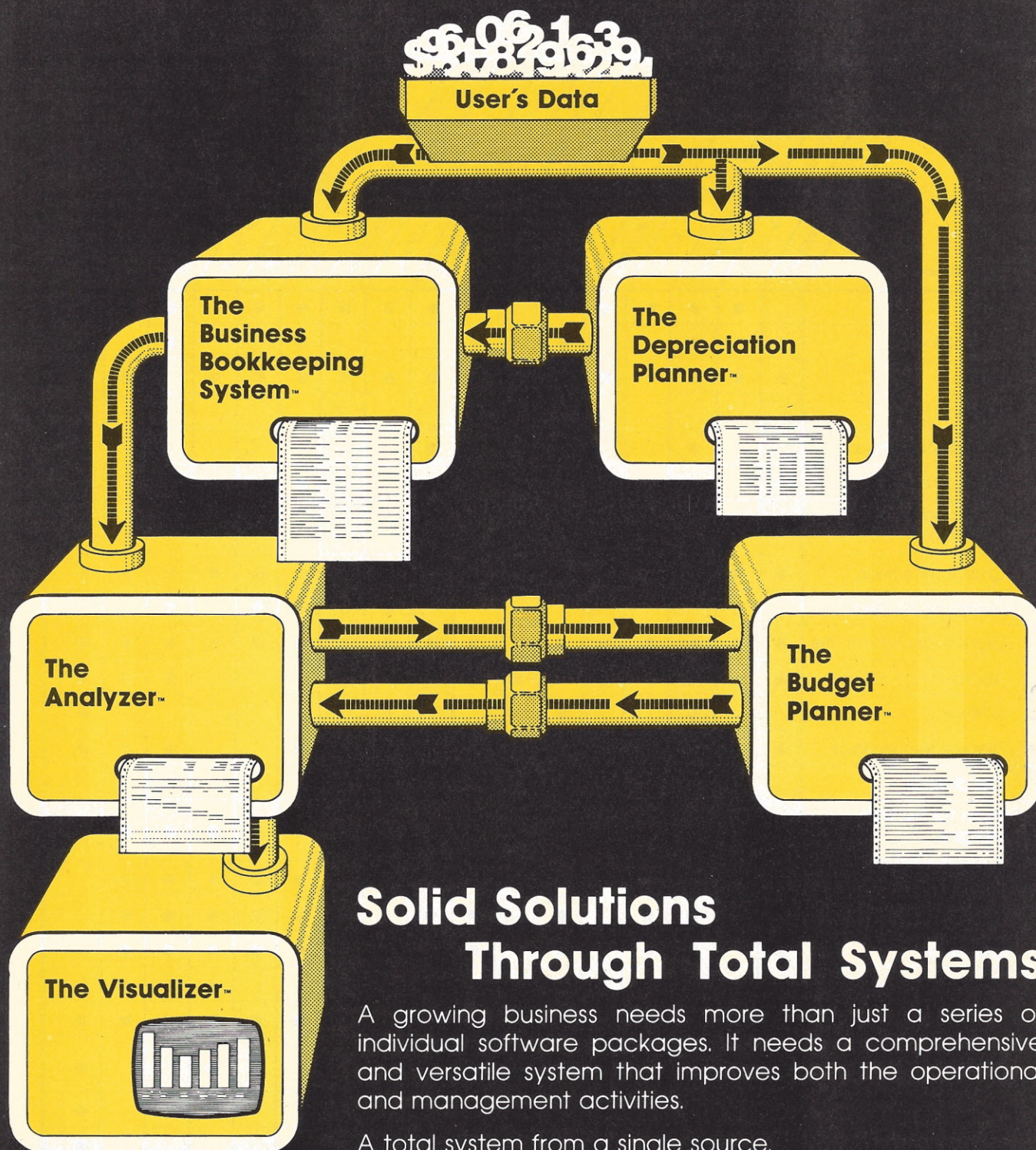
continued on page 78

SPECIAL REPORT

WORD-PROCESSING EDITING FEATURES

Feature/Company	APPLE COMPUTER	CHARLES MANN & ASSOC.	CROMEMCO	DAN P. BUNTEN	HAYDEN PUBLISHING	UG COMPUTER SERVICES	INFOSOFT SYSTEMS	INFORMATION UNLIMITED SOFTWARE	LJK ENTERPRISES	MICRO PRO INTERNATIONAL	MUSE SOFTWARE	NORTH STAR	ON-LINE SYSTEMS	PEACHTREE SOFTWARE	PROFESSIONAL SOFTWARE	RADIO SHACK	VECTOR GRAPHIC
Word wraparound			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Screen oriented	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Hyphenation			•	•			•	•	•	•	•			•	•	•	
Inverse video caps	•	•															
Scroll function: -Backward	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•
-Vertical	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Horizontal	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	
-Rapid/repeat key	•		•				•	•	•	•	•		•		•	•	•
Jump features: -Text beginning	•		•				•		•	•	•	•	•			•	•
-Text ending	•		•				•		•	•	•	•	•			•	•
-New screen/next pg	•		•				•		•	•		•	•			•	•
-Previous screen	•		•						•			•	•				•
-Middle of screen													•				
-End/begin line							•			•		•	•			•	•
Automatic alignment	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Cursor control	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Block features: -Copy	•		•			•	•				•	•	•		•	•	•
-Merge	•	•	•	•	•	•	•			•	•		•	•	•	•	•
-Move	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Insert features: -Character	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Block	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Line		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
-Word	•						•		•				•	•	•	•	•
-Manual text insert	•	•	•	•			•	•	•	•	•		•		•	•	•
-Word swap																•	
Delete features: -Character	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Character retrieval	•		•														•
-Words	•							•	•		•	•		•	•	•	

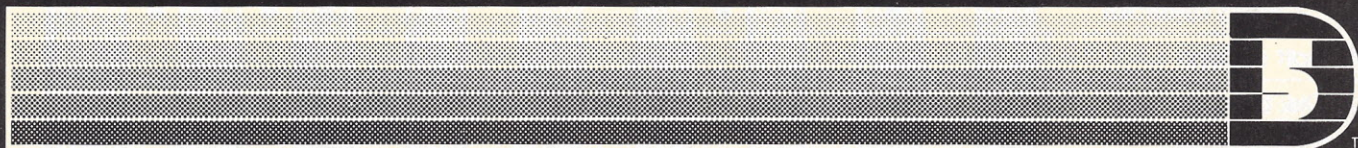
Feature/Company	APPLE COMPUTER	CHARLES MANN & ASSOC	CROMEMCO	DAN P. BUNTEN	HAYDEN PUBLISHING	UG COMPUTER SERVICES	INFORMATION UNLIMITED SOFTWARE	INFOSOFT SYSTEMS	LJK ENTERPRISES	MICRO PRO INTERNATIONAL	MUSE SOFTWARE	NORTH STAR	ON-LINE SYSTEMS	PEACHTREE SOFTWARE	PROFESSIONAL SOFTWARE	RADIO SHACK	VECTOR GRAPHIC
-Line			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Rest of line				•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Block	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Pages									•	•	•	•	•	•	•	•	•
-Block before cursor				•			•		•	•							•
-Block after cursor				•			•		•	•		•					•
Search and replace: -Search only			•				•	•									•
-Character strings	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Global on all disks										•	•	•	•	•	•	•	
-Current document/file	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Approximate strings	•		•				•	•	•		•					•	•
-N times			•				•				•						•
-Manual text replace	•	•	•	•			•	•	•	•	•	•	•			•	•
-Conditional							•										
Screen formatting: -Margins	•	•	•	•			•		•	•	•		•	•	•	•	•
-Tabs	•	•	•	•			•		•	•			•	•	•	•	•
-Underlining	•		•	•			•		•	•			•	•	•	•	•
-Centering	•		•	•			•		•	•	•		•	•	•	•	•
-Super/subscripts	•		•						•	•					•	•	•
-Page width/length	•	•	•	•			•		•	•			•	•	•	•	•
Paragraph methods: -By tabs	•	•	•	•	•	•	•	•	•		•				•		•
-Manual spaces			•	•		•	•		•								•
-By hitting return	•	•	•	•	•	•	•		•	•	•		•				•
-Control keystroke			•				•					•		•	•	•	•
Split screens												•					
Disk buffers	•		•	•					•	•	•		•	•	•		
Delete buffers	•									•				•			
Backup/crash recovery		•	•				•	•	•		•	•			•	•	•
Command/status line	•		•	•	•		•	•		•		•	•	•	•	•	•



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CIRCLE 39

SPECIAL REPORT

Word processing

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desired shape when it is printed—are: right and left page justification; at least single, double and triple spacing; left and right margins; setting pages for various lengths (which is important for legal-size documents); regular and multiple tabs; the ability to change margins and tabs inside a document or file; automatic pagination; centering; underlining; and manual page breaks.

Standard printing features should include: multiple copies of the same file; boldfacing and underlining; operator pause or print interrupt; overstriking characters; printing bidirectionally (most daisywheel printers do this; most dot-matrix printers do not); and single-sheet feeding.

The following is a short breakdown of the features various businessmen

umn and replacing it with another, deleting and replacing a column, duplicating a column, moving a column to another part of the same file, etc.

- Horizontal scrolling
- Simple sorting procedure, ascending and/or descending

For multiple short letters and correspondence:

- Form feed for continuously printed forms

- Address insertion at printing
- User-defined formatting command

• Insertion of individual names, such as taking a last name "Jones" from the address heading, "John J. Jones, president," and adding it to a form letter as "Dear Mr. Jones"

- Envelope printing—either singly or continuously

The features that a word processor should have actually depend more on what the user intends to do with the program than any other factor.

and professionals may need in a word-processing package.

For complex documents:

- Merging of text or addresses from various files during printing, or an automatic merge operation

- Automatic headers and footers
- Automatic replication of a letter or document

- Alternating even- and odd-numbered pages

- Interactive searching for, and replacement of, character strings

- Chaining or linking multiple files from one disk

For math and column processing:

- Split-screen function
- Automatic math functions, such as addition, subtraction, division and multiplication

- Column manipulations which include column swaps, blanking a col-

- Printing selected portions of a file

- Ability to skip addresses within a file so they are not printed

For people who prepare frequent reports:

- Subscripts and superscripts
- Temporary margins or indentations, such as making one paragraph with margins at columns 30 and 60, instead of a standard 10 and 70

- Double-column alignment
- Replication of entire document
- Automatic hyphenation with manual replace option

- Manual insert of text or characters

- Insert and edit document being inserted

- Word-by-word underlining for book and periodical titles

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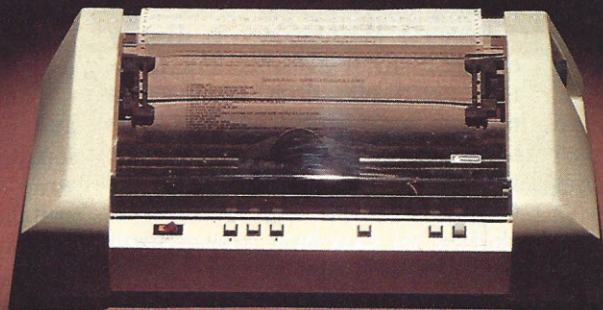
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SPECIAL REPORT

These are just a few of the dozens of features and functions that can be found among the available word-processing programs. Unfortunately, no one program has them all, or even most of them in an easily usable form. However, there are a number of good word-processing programs. By first diligently studying his own operations, a user can find one that fits his business or profession.

17 packages

The **Apple Writer** from Apple Computer is a text editor with simple, basic functions, but with limited word-processing features. Its most unusual feature retrieves the previous characters, words or sentences as long as the program is in the editing mode. It can work on only one 12-page document at a time, and it uses Apple's 24 × 40 screen.

The program indicates capital let-

Cromemco's **Writemaster** is a display-oriented word-processing program. Recently released, the program is designed to be easy to learn and use, and takes advantage of the special function keys available on Cromemco terminals. It is a completely menu-driven system that provides both command and single-keystroke functions such as mail-merge, index generation, paragraph aligning and justifying.

Because Writemaster is display oriented, all text-formatting functions are displayed on the screen as they are implemented, allowing users to view material to be printed. The program integrates with other Cromemco proprietary software, including its data-base management package. Writemaster runs under Cromemco's own operating system.

Dan P. Bunten's **Scribe** is the only Apple-based word processor that re-

T or another easy-to-remember command).

This more advanced, yet still limited, word processor comes in the Apple 3.3 version only.

Versatility times two

Hayden's **Apple PIE-FORMATTER** is, for the price, probably the most versatile word-processing package for the Apple, but it requires study to use all of its features, and can be confusing until the user is familiar with it.

The two parts of the package, **PIE** and **FORMATTER**, are actually separate programs. This lets a user write more text in a file, but when switching between programs, loading is time consuming. In addition, a program disk must be on-line at all times.

Apple PIE has a 21 × 38 horizontal window that moves left to provide a 64-column display instead of the standard 40 columns. It also displays only uppercase characters and inverse video unless the computer is equipped with the Dan Paymar lowercase adapter.

In addition to all of the basic editing functions, the program can shift columns left or right, add text to the end of lines, and execute file chains and inserts. **PIE** and **FORMATTER**, like the **Scribe**, are written in machine language for fast execution.

The manual has 200 pages of instructions. It includes a "walk-through" of a sample file on the disk that explains how to work with the most important formatting commands, and includes a fold-out summary card for easy reference when questions arise.

The package is available for the 40-column Apple, and for the three most popular 80-column adapters and formats. To protect against disastrous crashes, Hayden allows the user to make backup copies of the disk.

IJG Computer Services' **Electric Pencil** is available for the TRS-80 Models I, II and III and for CP/M-based machines with memory-mapped video. The Model I

continued on page 87

A user should not buy a really powerful package that he'll never use, or a package with so little power that he cannot grow into it as his word-processing activities expand.

ters in inverse video, and is one of several Apple-based editor/processors with this feature. A user can also execute block moves and merges, and search and replace character strings in a document.

Charles Mann & Associates' **Master Text Processor** is another relatively simple Apple-based text editor. The main advantage this package has is that it works in conjunction with the company's mailing-list program. The package has a simple form-letter writer, as well as separate search-and-replace functions. The program's structure also works more easily with full lines than with a mixture of characters, words, lines, sentences and paragraphs.

Its manual is written in a narrative style and is difficult to understand.

quires the Dan Paymar lowercase adapter (which types true upper- and lowercase on the screen rather than using inverse video for uppercase). It is written in machine language, and thus, it is quickly executed. The program also has a variety of advanced formatting features and a view mode—analogue to Apple Writer's "preview" mode—that lets a user see the copy as it will be printed.

One disadvantage of the program is that text files cannot be inserted into the file on which a user is presently working; they must be added at the end. The program also appears to require many more keystrokes than other programs, and its command keys do not relate very well to their functions (Control-Y for a tab setting, for example, instead of Control-

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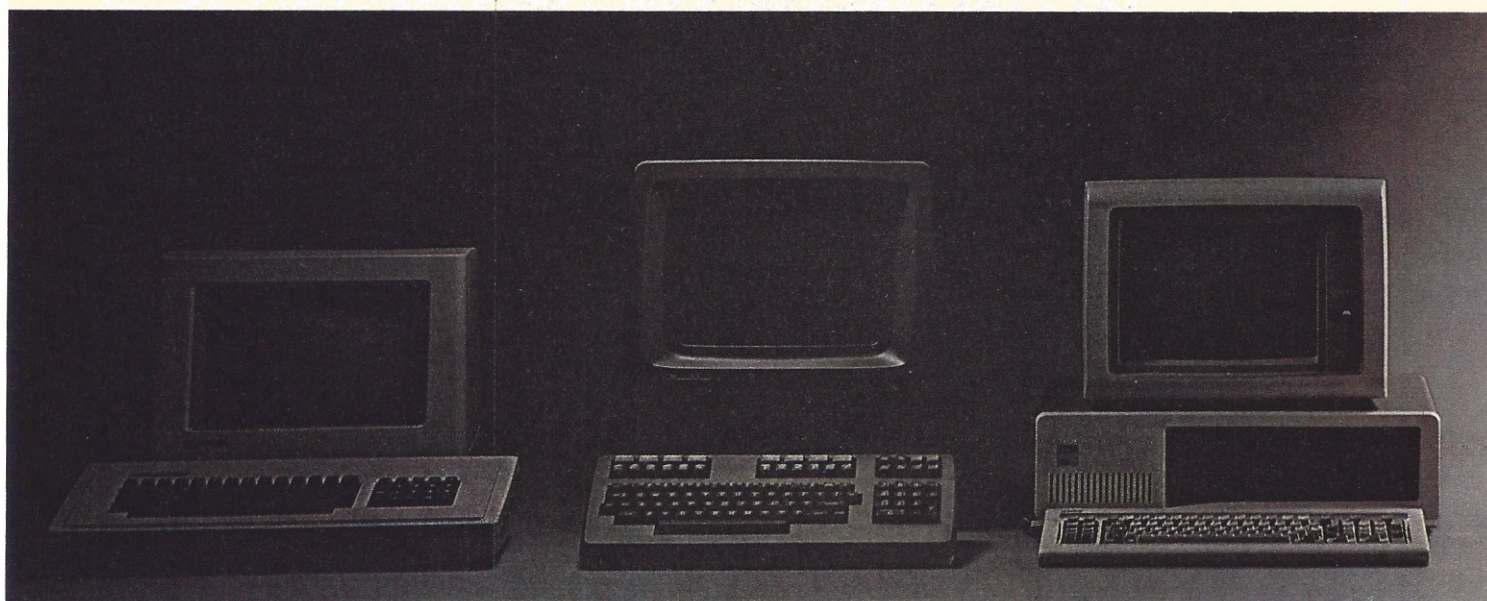
WORD-PROCESSING FORMATTING FEATURES

Feature/Company	CHARLES MANN & ASSOC. APPLE COMPUTER	CROMEMCO	DAN P. BUNTEN	HAYDEN PUBLISHING	UG COMPUTER SERVICES	INFOSOFT SYSTEMS	INFORMATION UNLIMITED SOFTWARE * LK ENTERPRISES	MICRO PRO INTERNATIONAL	MUSE SOFTWARE	NORTH STAR	PEACHTREE SOFTWARE	ON-LINE SYSTEMS	PROFESSIONAL SOFTWARE	RADIO SHACK	VECTOR GRAPHIC
Justification:															
-Right	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Left	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Center	•						•				•				•
-Filling	•	•													•
Proportional spacing			•	•			•		•		•	•	•	•	•
Stop justify		•	•								•	•	•	•	•
Paragraphs:															
-Indentation			•			•	•	•	•			•	•	•	•
-Lines between		•	•	•		•	•	•			•	•	•	•	•
-Character set	•	•			•	•			•	•		•	•	•	•
-Reverse indent							•		•				•		•
Tabs:															
-Set	•	•	•	•	•		•	•	•	•	•	•	•	•	•
-Clear	•	•	•	•	•		•	•	•	•	•	•	•	•	•
-Tab character	•	•	•	•	•	•		•		•		•	•	•	•
-Multiple tabs		•	•			•	•	•		•		•	•	•	•
Headers:															
-Page numbering		•	•	•	•	•	•		•	•	•	•	•	•	•
-Title setting	•		•		•	•	•		•		•	•	•	•	•
Footers					•		•	•	•		•		•	•	•
Centering	•	•	•		•		•	•		•	•	•	•	•	•
Line spacing:															
-Single and double	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Triple	•	•	•		•	•	•	•	•		•	•		•	•
-Multiple			•		•	•	•	•			•	•			•
Margins:															
-Right	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Left	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
-Bottom	•		•		•	•		•	•	•	•	•	•		•
-Top	•		•		•	•		•	•	•	•	•	•		•
-Page Length	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Feature/Company	APPLE COMPUTER	CHARLES MANN & ASSOC	CROMEMCO	DAN P. BUNTEN	HAYDEN PUBLISHING	UG COMPUTER SERVICES	INFSOFT SYSTEMS	INFORMATION UNLIMITED SOFTWARE	* LJK ENTERPRISES	MICRO PRO INTERNATIONAL	MUSE SOFTWARE	NORTH STAR	ON-LINE SYSTEMS	PEACHTREE SOFTWARE	PROFESSIONAL SOFTWARE	RADIO SHACK	VECTOR GRAPHIC
-Page width							•						•	•			•
-Defaults	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
-Release	•	•	•		•				•				•			•	•
File merging: -Insert into text	•	•	•		•	•	•	•	•	•	•		•	•	•	•	•
-Chaining/linking			•	•	•	•	*	•	•	•	•	•			•	•	•
Pagination	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Forced pagination			•			•					•		•			•	•
Hyphenation: -Automatic			•		•						•			•	•	•	•
-Manual			•		•	•			@				•	•			•
Super/subscripts			•	•	•			•		•	•	+			•	•	•
Underlining			•	•	•	•		•	•	•	•	•	•	•	•	•	•
Uppercase only option			•			•		•						•	•	•	•
Boldface printing			•		•	•	•	•			•	•	•	•	•	•	•
Boldface/underline			•			•		•					•			•	•
Blank lines			•			•							•				•
Blank character			•						•								•
Suppress blanks						•							•				
Pitch (for printers)	•		•	•	•	•	•	•	•	•	•	•		•	•	•	•
Print pause/interrupt		•	•						•		•	•		•	•	•	•
Comment line	•		•						•	•	•		•	•	•	•	•
Date/title line			•			•					•			•	•		•
Double-column print																	•
Even/odd page print			•														•
Print selected parts			•				•					•		•			
User-definable options		•					•	•	•		•	•		•	•	•	•

- # With Atari 825 printer, can use proportional and boldface fonts.
 • The company plans to provide this feature.
 @ In insert mode only.
 + With Diablo printers only.

NOW THAT YOU FIRST GET TAKE A LOOK



Welcome to a tour of the biggest Apple.
The Apple® III Personal Computer — the most powerful machine in its class.

Because it's the only personal computer that lets you add up to 256K RAM, hang on a full complement of peripherals, and still have four expansion slots left for future growth. (Unlike some micros which become woefully "slot-bound" when upgraded to maximum memory.)

Because it's the only machine now using 64K RAM chips to keep 256K tidy on a single board.

And because it's the only machine that gives you the help of SOS.

THE MOST SOPHISTICATED OS.

SOS is the Apple III's Sophisticated Operating System, an elegant software interface that frees you from most system control tasks. It features a hierarchical file system, device- and user-level interrupt capabilities, a device-independent file system and memory management capability.

Since all Apple III languages use SOS, they share a common disk format. So Apple III programs can merge and communicate — a Pascal application program can directly access a BASIC text file, for example.

Xerox 820	Hewlett-Packard 125 — Model 10	IBM Personal Computer	Apple III
Standard Memory			
64K	64K	64K	128K
Maximum Memory when fully configured*			
64K	64K	192K	256K
Expandability			
No expansion slots	No expansion slots	No extra expansion slots in fully configured* 192K system	4 extra expansion slots in fully configured 256K system*
Diskette Storage (per drive)			
92K	256K	160K	140K
Mass Storage (per drive)			
—	1.16 megabyte Floppy Disk	—	5 megabyte Hard Disk
Display Graphics Capability			
High resolution B/W	High resolution B/W	High resolution B/W or 4-color (color requires additional card)	High resolution B/W or 16-color
Software Available			
Word Processing Super Calc® — Communications — CP/M® library	Word Processing VisiCalc® 125 Business Graphics Communications — CP/M® library	Word Processing VisiCalc® — Communications — CP/M® 86 programs	Word Processing VisiCalc® III Business Graphics Communications Apple II software library CP/M® library (available Spring, 1982)

*"Fully configured" means system includes, at minimum, monitor, printer, 2-disk drives and RS-232C communicator. NOTE: Chart based on manufacturer's information available as of December, 1981.

'VE SEEN THEIR GENERATION AT OUR THIRD.



SOS allocates system resources to make the most of dynamic memory, simplifies programming with standard device and file interfaces for all languages, and speeds software development by reducing program size and complexity.

OUR NEW PROFILE.

ProFile™ is Apple's new personal mass storage system—a quick, quiet 5MB hard disk ideal for software development or any mass storage application. Shown above twixt monitor and console, it comes with everything you need to get up and running, including interface card and driver software.

The III's standard built-in drive is a 140-K floppy that can be daisy-chained with three additional drives through a back panel connector. Which leaves you plenty of expansion slots for things like our new Universal Parallel Interface Card or our OEM Prototyping Card.

CHANGE KEYS.

The 128-character ASCII-encoded keyboard happens to be fully-programmable. So you can (with SOS) do neat things like remap it into

DVORK. Or create armies of special function keys. Or teach your Apple to write Chinese.

Its own languages already include Business BASIC, UCSD Pascal™, Assembly and, soon, a powerful new COBOL—and, in emulation mode, most languages available for Apple II.

Look up from the keyboard and you'll see our standard Monitor III green phosphor display (80 char. x 24 lines, u/l). It can show you some of the highest resolution graphics available—560 x 192 in 16 gray scales. Or choose a color monitor, and you could be seeing 16-color graphics in high 280 x 192 resolution.

HIT LIST.

We have a new edition of that monster hit, VisiCalc® with more modeling space than any other version. Plus AppleWriter III, a powerful new word processing package. Plus a new Business Graphics package. Plus a new Mail List Manager.

Plus a Pascal Utility Library that lets you take full advantage of all UCSD Pascal features.

Plus Access III—sophisticated smart terminal software to access mainframes with asynchronous communications up to 9600 bps.

Plus Apple II emulation to access that vast software library.

Plus, soon, a CP/M® card to access that other vast library.

Even with all this, the Apple III's potential remains essentially untapped.

So we're offering improved documentation, new programmer's aids, expert hotline counseling and an open channel to the industry leader in software publishing. Us.

See your Apple dealer for more information and, perhaps, a little comparison shopping.

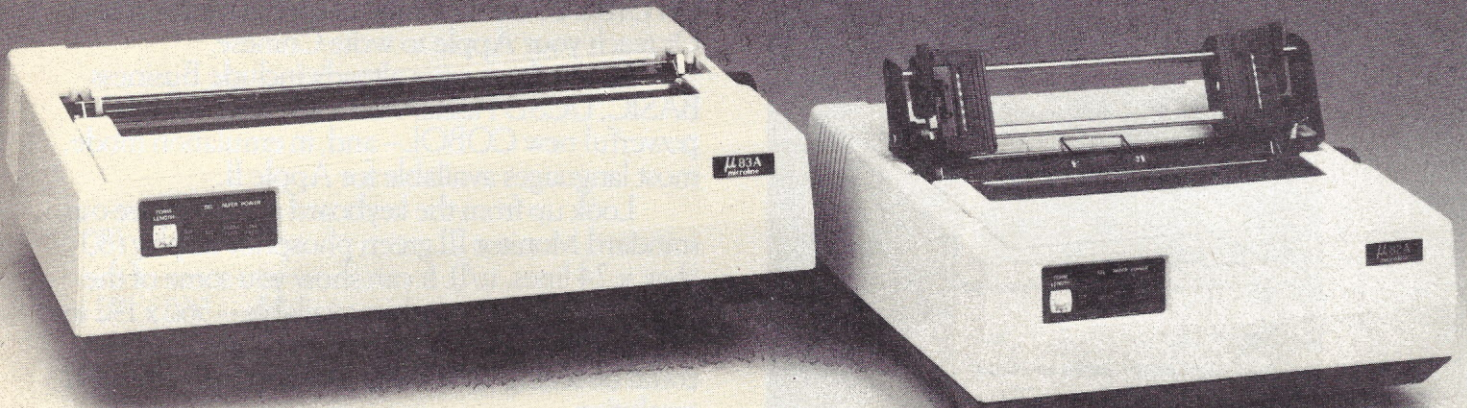
We're sure you'll find that between our third generation and their first, there's quite a gap.

The personal computer.



For the authorized dealer nearest you, call (800) 538-9696. In California, call (800) 662-9238. Or write: Apple Computer Inc., 10260 Bandley Dr., Cupertino, CA 95014. VisiCalc is a registered trademark of Personal Software, Inc. UCSD Pascal is a trademark of the Regents of the University of California. CP/M is a registered trademark of Digital Research, Inc. Apple is a registered trademark

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Models 82A, 83A & 84A from ASAP

OKIDATA's new printer line represents a breakthrough in economical, quality printing. These new printers have more options and features than any previous OKIDATA printer. Faster print speed and throughput, full 96-character ASCII, and both Centronics and RS232C interfaces standard, all at an affordable price. These

models are ideal for home or business, personal or educational applications. And now, ASAP is offering these new printers at prices you won't want to miss. Compare the features below. Then call ASAP to order your OKIDATA printer today. Dealer inquiries invited.

Features	Okidata 82A 80 Column Printer	Okidata 83A 136 Column Printer	Okidata 84A 136 Column Printer
Print speed	120 characters per second	120 characters per second	200 characters per second
Throughput @80 char./line	76 lines per minute	76 lines per minute	114 lines per minute
Print technique	Bidirectional	Bidirectional	Bidirectional
Dot matrix	9 x 9	9 x 9	9 x 9
Character set	Full 96-character ASCII	Full 96-character ASCII	Full 96-character ASCII
Graphics characters	64 block characters	64 block characters	64 block characters
Interface			
Centronics 8-bit parallel	Standard	Standard	Standard
RS232C (1200 bps)	Standard	Standard	
Size (inches)	14.2W x 12.9D x 5.2H	20.2W x 12.9D x 5.2H	20.2W x 12.9D x 5.2H
Ribbon	Standard typewriter	Standard typewriter	Standard typewriter
Power	100, 115, 220, 240 VAC 50 or 60Hz	100, 115, 220, 240 VAC 50 or 60Hz	100, 115, 220, 240 VAC 50 or 60Hz
Two New Features			
2K Serial bufferboard (RS232)	Optional	Optional	Optional
Okigraph, HI-RES Graphics 72 vert. x 72 horiz. dots/inch	Optional	Optional	Optional

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Word processing

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or III versions work with disk, tape or stringy floppy, but other versions come on disk only.

Electric Pencil features extensive debugging over the original, help menus and revised documentation, but retains the command structure. It is designed to trap and/or recover from almost any situation. The program has a unique feature that allows users to hook an audio cassette into the computer's cassette port, and start and stop it from the keyboard for dictation transcription.

The package runs on a wide variety of operating systems used with TRS-80s, and the user need not buy different versions each time he changes systems. It is compatible with all lowercase modifications without keyboard modification, and all file commands use standard TRS-80 mnemonics.

InfoSoft's **WpDaisy** is an advanced and versatile word processor for CP/M and I/OS-based personal computers. It allows simultaneous text entry and printing, which in a high-volume office, is a feature that can increase production tremendously.

Another feature that some users might appreciate is Daisy's ability to shift a printer ribbon for red-ink printing. This could make very attractive business reports or proposals, although it is a bit fancy for correspondence and articles.

The program also comes with a routine that lets a dealer adapt it to dozens of CPU, disk-drive and printer configurations. In addition to dozens of standard and advanced features, it has one of the few "soft" or user-definable hyphens. The user enters hyphens with an embedded command during the rough-draft stage. When he prints a document or file, the computer decides whether or not a hyphen is needed at any particular location.

The program comes with two manuals. The first, *Daisy Train*, is a training manual, and the second is a detailed manual that is one of the

best available. This second manual is well organized, and includes introductory and "procedures" sections. The procedures section goes through basic steps for creating and manipu-

lating various types of text files. An important step, for example, is called "creating a document from standard paragraphs."

Although the program has many

The powerful package:

Super-Text II™

Allows you to learn the basics of text editing quickly. Advanced features will meet your expanding word processing requirements far into the future. \$150.00

plus Form Letter™

Provides automatic repetitive printing of letters. Allows insertion anywhere in a letter, also direct entry, optional prompting, special commands. \$100.00

plus Address Book™

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From the leader in word processing for the Apple II or II Plus

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the name of your nearest MUSE dealer

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useful features, it has a limited maximum text size of about 12 pages, or 24,000 characters, on a 48k machine. A 64k RAM allows for 20 pages of text. This capacity makes the package a very powerful word processor for offices with documents of less than 20 pages.

Logical and concise

Information Unlimited Software's **EasyWriter Professional** is an excellent program for offices that need a sharp form-letter and mailing-list processor. It is not designed to be a long-document processor, although long documents can be created by linking files together.

To produce the mailing list, the user must add EasyMailer, also from Information Unlimited Software. EasyWriter has all of the basic word-processing features, but its best feature is its manual, which was written using EasyWriter. The manual is clearly written and explains all features and functions in a logical, concise manner. Further, the menus that appear on the screen make the program very easy to use.

LJK Enterprises' **Letter Perfect** is one of the few word processors available for the Atari. The program is also available for the Apple. Although the company promises more in the near future, the Atari version is currently only configured for the Atari 825 and Epson MX-80 printers. Its new Version 5.0 for the Apple, however, does allow reconfiguration of the default values for many formatting commands, such as the headers and footers.

When working with the program, a user can establish a "data-base" file with the new version. Basically, this translates into a name-and-address file, but the program must be modified to accomplish this.

The program manual uses long paragraphs to explain each feature and function. It only pulls these features and functions together in one short "editing-a-letter" section, and the manual doesn't include many examples of how the program commands work.

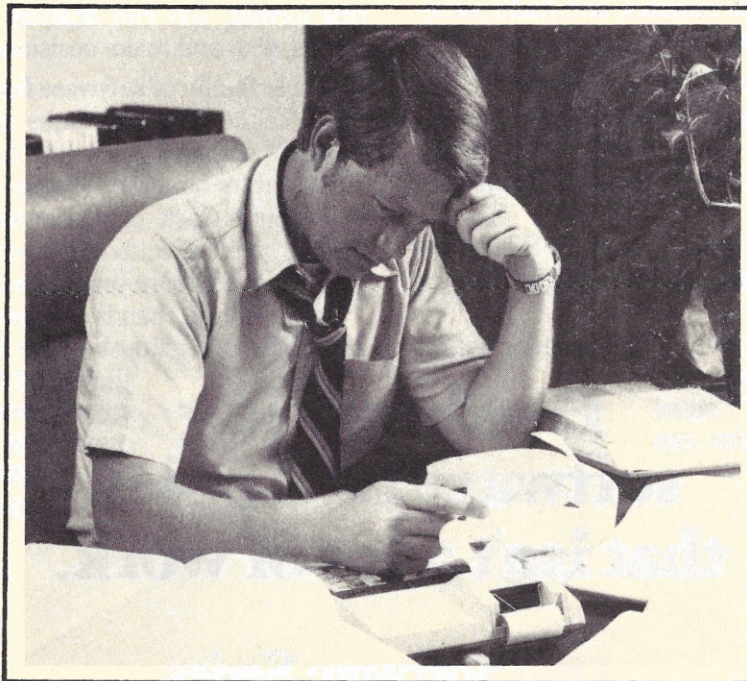
The program does have a number

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WORD PROCESSING BUYERS' GUIDE

COMPANY	NAME/PRICE	CONFIGURATION/CAPACITY
Apple Computer 10260 Bandy Dr. Cupertino, CA 95014 (408) 996-1010	Apple-Writer \$75	48k Apple II or II Plus, one disk; 40 column only; record size limited to RAM capacity.
Charles Mann & Assoc. 7594 San Remo Trail Yucca Valley, CA 92284 (714) 365-9718	Docuwriter \$249.95	48k Apple II or II Plus, one disk; AppleSoft Language; 40 column only; capacity limited to available RAM.
Cromemco 280 Bernardo Ave. Mountain View, CA 94043 (415) 964-7400	Writemaster \$594 (dictionary \$295)	Any Cromemco computer with 3102 video terminal, 64k; one or more disk drives; record size is disk limited; CDOS or Cromix operating system.
Dan P. Buntin 108 Broadmoor Dr. Little Rock, AR 72205 (501) 666-8001	Scribe \$80	Apple II or II Plus with AppleSoft ROM or Language Card, 48k, one drive; requires Dan Paymar lowercase adapter and printer; 40-column display only; DOS 3.3; record size limited to available RAM.
Hayden Publishing Software Division 50 Essex St. Rochelle Park, NJ 07662 (201) 843-0550	Apple PIE/ FORMATTER \$129.95	32k minimum, 48k recommended Apple II or II Plus, one drive; record size limited to available RAM.
IJG Computer Services 1260 W. Foothill Blvd. Upland, CA 91786 (714) 946-5805	Electric Pencil \$85.95 source code \$29.95	TRS-80 Models I, II and III, and CP/M systems with memory-mapped video; Model I/III versions work with disk, tape or stringy floppy; other versions on disk only; compatible with lowercase modifications.
InfoSoft Systems 25 Sylvan Rd. S. Westport, CT 06880 (203) 226-8937	WpDaisy \$450 (I/OS) \$495 (CP/M)	32k-48k systems with I/OS or CP/M; requires direct cursor addressing or CRT with memory mapping.
Information Unlimited Software 281 Arlington Ave. Berkeley, CA 94707 (415) 525-9452	EasyWriter Professional System \$250	48k Apple II or II Plus, one disk, 80-column video board required; this runs in DOS 3.2 only; records limited to available RAM.
LJK Enterprises P.O. Box 10827 St. Louis, MO 63129 (314) 846-6124	LETTER PERFECT Version 5.0 \$149	48k Apple II or II Plus, DOS 3.3; 40 column or one of five 80-column boards; one drive; record size limited to available RAM. Also Atari 24k, one drive and Epson MX-80 or Atari 825 printers.
Micro Pro International 1299 Fourth St. San Rafael, CA 94901 (415) 457-8990	WordStar 2.1 \$495 MailMerge \$150 SpellStar \$250 For Apple: WordStar 3.0 \$375 MailMerge \$125 SpellStar \$200	48k CP/M systems; two drives recommended for regular version. For Apple version 3.0, 48k Apple II Plus; Microsoft SoftCard and either VIDEX or Sup'R Term 80-column video board; DOS 3.2 or 3.3 but must be specified. SpellStar for CP/M versions only.
Muse Software 330 N. Charles St. Baltimore, MD 21201 (301) 659-7212	Super-Text II \$150 Form Letter \$100 Address Book \$49.95	48k Apple II or II Plus; one drive; 40-column only; can add Dan Paymar adapter; record size limited to available RAM; DOS 3.2 and 3.3 on same disk; AppleSoft ROM required to use all together; shift-key modification kit included and installation recommended.
North Star 14440 Catalina St. San Leandro, CA 94577 (415) 357-8500	Northword \$399-\$499 depending on configuration	Horizon and Advantage computers, 56k; 2 disks; record is disk limited; ASP operating system.
On-Line Systems 3675 Mudge Ranch Rd. Coarsegold, CA 93614 (209) 683-6858	SuperScribe II \$129.95 (dictionary \$99.95)	48k Apple II or II Plus; both DOS 3.2 and 3.3 included; two disk drives recommended; 70-column display with no hardware; text file limited to 56k or disk capacity.
Peachtree Software Suite 700 Three Corporate Square Atlanta, GA 30329 (404) 325-8533	Magic Want about \$400	32k minimum, 48k recommended CP/M; one drive minimum, two recommended.
Professional Software 166 Crescent Rd. Needham, MA 02194 (617) 444-5224	WordPro 4 Plus \$450	Commodore CBM 8032, with 4040 or 8050 dual drives; CBM dot-matrix printer or ASCII letter-quality printer and special ROM chip; record size limited to 31,743 bytes, or about 25 pages.
Radio Shack 1300 One Tandy Center Fort Worth, TX 76102 (817) 890-3272	Scriptit II \$199 Scriptit I \$99.95	48k TRS-80 Model II minimum, 64k recommended; one disk drive, two recommended; 32k TRS-80 Model I, Level II or Model III for Scriptit I on cassette tape.
Vector Graphic 500 N. Venita Park Rd. Thousand Oaks, CA 91320 (805) 499-5831	Memorite III from \$450	Vector Graphic computers, 56k, one or more disks; record size is RAM limited; runs on CP/M.

CASH FLOW PROBLEMS?



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including a balance-due and delinquency aging report, and take care of dozens of other tasks that eat into your time and profit!

Computerized business systems from the MicroAge Computer Store are available in the \$5,000 to \$15,000 range, to suit the individual budget of your small business or professional practice. MicroAge backs up every system with personalized service, warranty service and repair, installation, systems consulting, even customer training. Visit the MicroAge Computer Store in your area soon with your business problems, and let us help you with the solution.

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Aurora, Colorado
(303) 696-6950
Rochester, New York
(716) 244-9000
Hurst, Texas
(817) 284-3413
Salina, Kansas
(913) 823-7596
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(312) 349-8080

Milwaukee, Wisconsin
(414) 257-1100
Mountain View, California
(415) 964-7063
Scottsdale, Arizona
(602) 941-8794
Anchorage, Alaska
(907) 279-6688
San Diego, California
(714) 278-0623

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Minneapolis, Minnesota
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PFS and PFS: REPORT let you concentrate on doing your work, not on working your computer. There's no complicated programming or computer language to learn. Using the PFS Series is so straightforward, you can learn it in as little as 20 minutes, and that's something both experts and beginners can appreciate.

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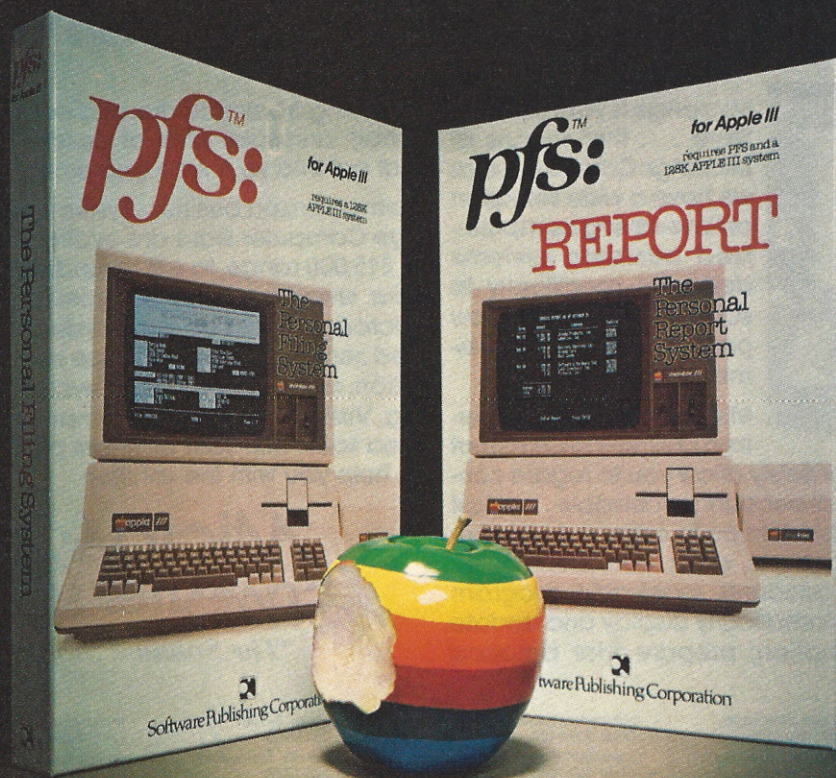
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Direct-mail marketing

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computers can really help the small business. Robert Kelleher, author of a new book, *Industrial Marketing and Sales Management in the Computer Age* (CBI Publishing Co.) says that "Most companies try to keep a list of their customers, but few do a particularly good marketing job with it."

Massaging lists

Direct-mail specialist Bellamy advises clients that "your best sources of new business are your current and past customer lists." What Kelleher calls the "care and feeding of the customer list" and Bellamy describes as "the massaging of the customer list," is what computers do best. By organizing information for each entry, you can get the maximum marketing mileage out of a mailing list.

In his book, Kelleher lists 25 basic

pieces of information that should be contained in a customer file. While very few people will need to include all these data, ranging from name to credit balance to the designated sales rep, Kelleher's list is a helpful guide to classifying files.

Much of the same information can also be gathered for your prospect list. While your customers represent prospects for new business, you can also keep a separate prospect list, or simply give it a different code. Some small businesses trade prospect listings with non-competing businesses that serve similar customers, which non-profit fundraisers have been doing for years.

While most people interviewed here are using their computers for new business solicitation via the mail, Kelleher sees the uses for computers in marketing going far beyond that.

In his book, he outlines 14 model marketing programs derived from basic information in a customer file. These programs target and segment portions of the list according to such factors as amount of business, geographical region and sales-rep performance. Every model program has been run on a large computer, says Kelleher, although he has not worked on a personal machine. But, he says, "I don't see any reason why they wouldn't work on a small computer."

These are not line-by-line programs. They are, instead, model programs providing the basic formulas, equations and examples of output. There are relatively few commercial marketing programs available, so those wanting to pursue Kelleher's models will, for the most part, have to write their own programs.

Market research, a valuable part

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DBCALC (with 1040 model included) requires VisiCalc™ \$20.00

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CIRCLE 34

WHAT'S BETTER THAN SPEED READING?

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(SPEED PLUS COMPREHENSION)

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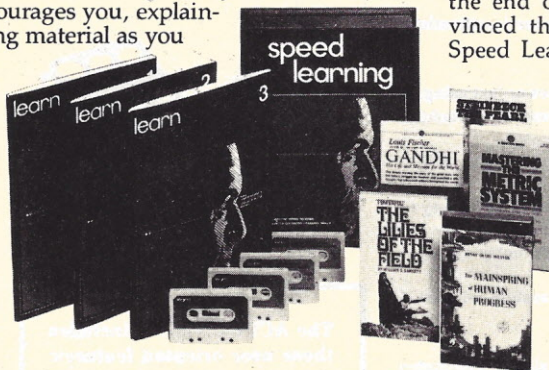
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PCOM-3

PROFESSIONAL COMPUTING

of direct-mail marketing, is also covered in Kelleher's book in a chapter entitled "Marketing Intelligence Gathering." He provides 10 sample questionnaires to adapt to your own marketing purposes. Using a word processor, these questionnaires can easily be adapted to fit the particular application and then can be sent out to the appropriate segment of your mailing list. Using available data-management programs, you can process the returned questionnaires on your personal computer.

Smaller and faster


Narrowcasting, target marketing, market fragmentation—these are all terms used to describe the growing trend toward smaller but more precise marketing and advertising efforts. As these trends grow, fueled by the increasing cost of communications, the role of the personal computer will expand. Already, three of Bellamy's clients have taken their

mailing lists off mainframe computers and are putting them on personal machines, because they want smaller lists and faster service.

A lumber company discovered that "it can't get enough time" on the big computer, reports Bellamy. The machine and its programmers are too busy with accounting, payroll, invoicing and other business functions to give marketing the daily effort it requires. Bellamy also discovered that the list used for billing and shipping is not the best list for marketing. It would be too expensive to change the program at this time. Instead, the company is switching its direct-mail marketing lists to an IBM personal computer.

A book publisher has also discovered that its mainframe cannot respond quickly enough for its direct-mail-marketing effort. The company cannot generate a new, updated list overnight, says Bellamy. Rather, they are putting their mailing list on

a Lanier word processor. So, too, a bank has discovered that its main computer simply cannot cope with the small, highly segmented lists it requires for Jumbo certificate holders, for instance. Since the machine is too busy with the bulk data processing, the bank has switched its mail-marketing lists to a much smaller word-processing machine.

"More and more people are getting into the small computers," for direct-mail marketing, says Bellamy. One direct-mail firm is even using an Apple personal computer to keep an updated list of its lists available for sale, and to keep a detailed record of the transactions for each list in its inventory. 

Alan Radding resides near the Massachusetts mecca of high technology, Route 128. He is a free-lance writer and frequent contributor to Personal Computing.

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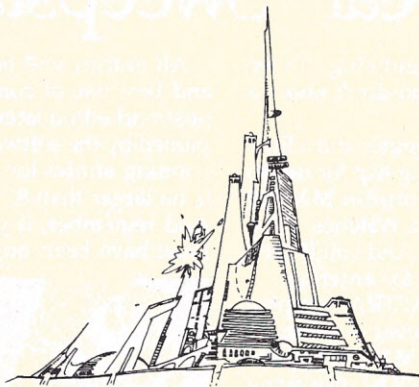
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TRS-80

COLOR-80



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All entries will be judged on originality, creativity and best use of computer equipment. They must be postmarked no later than May 1, 1982, and be accompanied by the software program, so we can recreate the winning entries for verification. Make sure the graphic is no larger than 8" x 10" and no smaller than 4" x 6". And remember, if you digitize art or a photograph, it must have been originally created by you.

So get busy and enter. You might be a winner.

And your software could be your "softwear."



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- 1) Any computer equipment may be used to format the entry, but the graphics output must have been printed on an Epson MX-70, MX-80, MX-80 E/T or MX-100 printer with either built-in or optional GRAFTRAX. Winning entries will be re-created by Epson for verification.
- 2) Each entry must be accompanied by the software program used to create it. All entries and software and the rights to use them become the property of Epson America, Inc.
- 3) All entries must be at least 6"x4" and no larger than 8"x10" in size.
- 4) Art or photographs, if used, must have been created by the entrant.
- 5) All entries will be judged by an independent panel of judges on their creative merit, originality and best use of computer equipment. Decision of the judges is final.
- 6) This contest is valid from January 1, 1982 until May 1, 1982. Entries must be postmarked no later than May 1, 1982.
- 7) Participation in the Epson "Software" Sweepstakes is open to any except the following: employees of Epson America, Inc., its service agencies, or their families.
- 8) Winners will be notified by mail no later than June 1, 1982. A list of winners will be made available by sending a stamped, self-addressed envelope to Epson America, Inc., 3415 Kashiwa Street, Torrance, CA 90505.
- 9) Entries will be maintained on file at Epson America, Inc. until January 1, 1983.
- 10) Prizes are as follows: First prize includes round-trip economy air transportation for two to Tokyo, from the airport nearest the winner's place of residence, and six nights standard hotel accommodations, double occupancy. Trip does not include airport departure taxes, hotel service charges, cost of transportation or other expenses incurred before leaving the airport of initial departure, returning to Tokyo airport and returning home from the airport of initial departure; nor does it include meals or gratuities. Second prize consists of one Epson MX-100 Printer. Third prize consists of his and hers Seiko Quartz Watches. Additional prizes include 25 Micro-Nine Printheads, 50 Epson Digital Watches, and 100 Epson Ribbon Cartridges.
- 11) You may enter more than once, but each entry must be accompanied by the official entry coupon below.
- 12) Void where prohibited by law.

Attach this form firmly to the back of each graphic you enter.

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STREET _____
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PRINTER MODEL AND SERIAL NUMBER _____

T-SHIRT SIZE _____ S _____ M _____ L _____ XL

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EPSON
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BUSINESS COMPUTING

Accounts receivable

continued from page 48

ness one particular way, it's hard to change," says the firm's president, "but our invoice volume had grown so large, I knew we needed a more efficient way of handling it."

Before buying a TRS-80 Model II with the Radio Shack Accounts Receivable package, the firm employed a full-time bookkeeper to handle receivables, payables, payroll, etc. The bookkeeper is still employed, but now she has a helper to keep track of the miasma of details and make sure things run smoothly.

"We're doing about \$2.5 million a year in sales, which adds up to a lot of invoices," the president says. "Now that we've put our receivables on the computer, invoices are being sent out promptly and payments seem to be coming in faster."

The bookkeeper enters all receivables information into the computer at the end of each work week. Invoices are generated according to sales slips. The computer figures in applicable sales tax, customer discounts and payment terms.

"Our purpose in getting this system wasn't to replace the bookkeeper," the president says. "It was to increase the efficiency of the accounting function, which we've done. The computer does balancing, profit and loss sheets and aging, and it does those things in a matter of seconds, rather than hours. For the time savings alone, it's been a wise investment. The efficiency makes it even more valuable."

Perhaps the greatest value in computerizing a company's operations is that it raises the firm's level of efficiency immeasurably, and in doing so it enhances the corporate image. This is especially important for smaller companies that often find themselves in losing sales battles with larger firms that can use their assets to impress prospective customers with major-league record keeping and materials shipments that run like clockwork.


"Small companies are always try-

ing to look larger than they really are," says Jim Ferguson, a consultant at Nucleus, Inc., an Alviso, Calif., management company that specializes in audio visual and digital equipment. "Computerization, especially in accounts receivable, gives your company a better frontage look."

Nucleus began using a Radio Shack bookkeeping program over a year ago to handle its more than 300 accounts. Ferguson says that his company's experience with the program clearly shows that the difference between a small company and a large one is less obvious when the wild paperchase of bookkeeping is pulled into line.

"It breaks down very simply," Ferguson says. "A small company with maybe five or six employees has 20 to 25 percent of its staff and labor time tied up in bookkeeping and detailed financial reports. At a large company, that percentage is only one to two percent of its labor force and time. With computerized bookkeeping, our small firm, and others like it, are able to lower the time percentage devoted to accounts receivable to four or five percent."

With less time dedicated to bookkeeping, Ferguson and his counterparts at other firms assert that a company's energies can then be focused on research and development, sales programs, management techniques, etc. When the bottom line is totaled, this shift in the way a firm's man-hours are used will contribute to a larger profit margin, they say.

As one put it: "It's obvious. The more time a company can spend catching up with the competition, the more respectable that company will be as a competitor." 

Californian Betsy Gilbert and New Yorker Jason Birmingham are freelance writers. Their western and eastern views of the personal-computing phenomena are often reported in these pages.

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ADVANCED COMPUTING

Programming

continued from page 70

are many dialects of BASIC. The dialect used is generally dependent upon the computer manufacturer of the BASIC ROMs. For example, Atari BASIC is not exactly the same as TRS-80 BASIC or Microsoft BASIC, but they are all basically structured in the same way. These examples are sufficiently simple to be similar to the BASIC you are using, but check your computer's BASIC manual if you have any problems.

Armed with only the information discussed so far, one can begin work on a simple program. Before the actual writing of such a program begins—one that would have the computer print HELLO THERE, for example—it is important to first describe the task the computer is to perform with an algorithm.

An algorithm is a complete set of steps for accomplishing a task. Programs are written in a specified computer language, but an algorithm doesn't have to be written in any particular language. Since an algorithm is not constrained by the conventions and limited vocabulary of a computer language, it is easier to express the steps of a problem in this manner. It is impossible to get the computer to perform a task if an algorithm is not written and then translated into a programming language. An example of an algorithm might look like this:

- 1 Say "Hello There"
- 2 Quit

The program

To start writing a program, a user must know some of the statements in the BASIC language that correspond to the statements in the algorithm. To turn the algorithm into a BASIC program, three things must be done. First, the PRINT statement must be used, which is the BASIC way of saying that something should be printed on the screen. At this point, this is the only easy way for the computer to give information. Second, the END statement must be used to tell the processor to stop. Finally, no periods

should be included after the step numbers. A proper BASIC program for a greeting would look like this:

```
1 PRINT "HELLO THERE"  
2 END
```


When these two steps are typed on the keyboard, the processor accepts this information and stores it in a section of RAM memory devoted to program development. Since the statements are numbered, the processor knows that it has been given a list and that this list should be saved in memory, and not executed.

To execute the program, the computer must be given a command that says "Go." The BASIC word used for execution is RUN. If this command is typed on the keyboard, the following appears on the screen:

```
RUN  
HELLO THERE
```

There is no number in front of "RUN," because it should be immediately executed.

After typing in these examples, remember to hit the RETURN or ENTER key at the end of each line. This tells the processor that the line is complete, and that it should be interpreted.

Although the program is simple and does not accomplish a practical task, learning to use it is the first step in becoming computer literate. As you develop more sophisticated programs, the hardware and software mechanisms will become more understandable. 

Editor's note: Part II of our Programming primer will appear next month. We will explain more of the BASIC vocabulary, along with some elementary programming constructs. We'll also show you how easy it is to manipulate the computer's memory and input and output devices with simple statements.

Leon Starr is a principle of Educomp, a firm which trains people in the use of computers.

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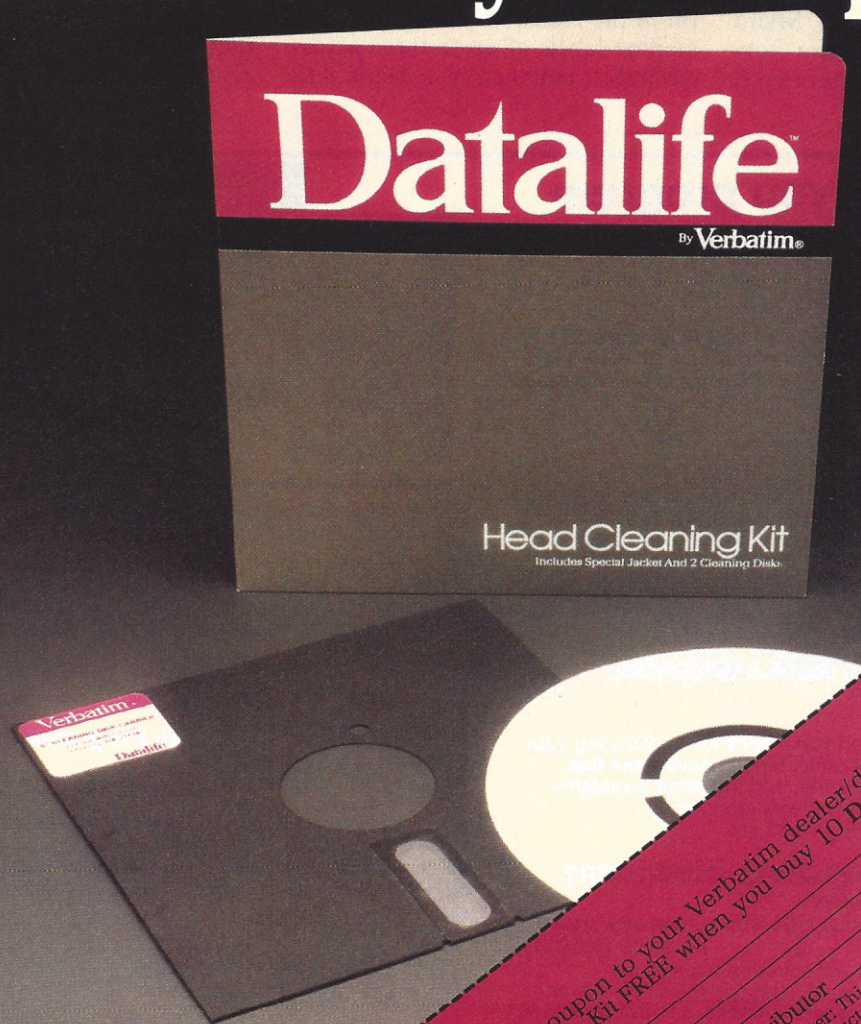
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SPECIAL REPORT

Word processing

continued from page 88

of advanced features for an Apple-based system, although it is not as complete as Apple PIE or CP/M-based word processors.

Impressive features

Micro Pro International's **WordStar**, **MailMerge** and **SpellStar** make up one of the best word-processing systems available for CP/M-based systems.

The WordStar portion of the system is incredibly varied. Its most impressive features are variable-speed scrolling, inverse-video display of blocks being manipulated, and automatic text justification as it is entered.

To help the user understand the somewhat complex manual, Micro Pro has divided it into two separate manuals for beginners,

which includes a training guide and an operator's guide. Also included are three older manuals.

WordStar's Version 3.0 includes horizontal scrolling with up to 255 columns. It also has a 22-column scroll default which can be changed. Micro Pro has added a column mode so columns of text and numbers can be moved, copied and deleted, but word wrap and column justification are still not possible.

The MailMerge portion of the package adds powerful form-letter and data-file features. These features include inserting data files and address files into form letters, standard paragraphs, repeated letters and multiple copies. Other features are fill-in-the-blanks in standard forms, mailing labels of up to three across, envelopes, omission of a blank data

line, variables within a document and repetitious processing of an inserted file.

SpellStar, a dictionary program similar to the SpellGuard program from Innovative Software Applications, takes Word Star beyond any word processor that cannot work with one of the various dictionary programs.

SpellStar has a 20,000-word, user-definable dictionary. Using the program, special dictionaries for technical or business words can also be compiled.

Chaining files

Super Text II from Muse is a good word processor for the Apple computer. It has a mathematics mode that acts as a 15-digit, four-function calculator, and also has a split-screen

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C. Roger Smolin

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(1-08494-8) 1981 176 pp. \$8.95

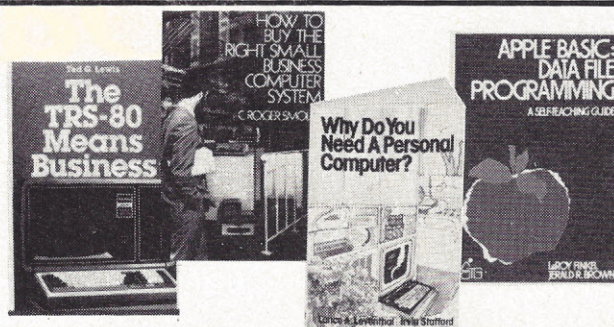
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SPECIAL REPORT

function. The package is complete with all of the basic and a few advanced word-processing features.

Super Text II also features the AUTOLINK function, which allows a user to chain any number of files on up to four Apple disk drives. No other Apple-based word processor can chain so many files or various disks. Simple commands chain forward or backward, or set up a circular link structure so that any desired record will be processed regardless of where the linked operation begins. In addition, the program has "FIND" and "FIND-AND-REPLACE" functions in AUTOLINK.

The program manual is comprehensive and comes with an easy-to-use reference card. The package itself does not offer many advanced features, but it is among the top three word processors for Apple computers.

North Star's **Northword**, which runs on Horizon and Advantage com-

puters, features a unique keyboard label that eliminates the need to memorize control keys. The program is menu driven, except for the editing functions provided in the keyboard overlay.

Northword functions with other North Star applications software to produce financial programs, reports, personalized mailing pieces, checks, statements, etc., and what appears on the screen typically matches the finished product.

A self-teaching manual and sample diskettes for the first-time user are provided.

On-Line Systems **SuperScribe II** is another Apple-based word-processing package. Among the newest of the word processors, it is also the only Apple word processor that can write to an entire disk; its file size is not limited to available RAM like the others. This advantage, plus its many advanced functions, makes it a

good package for users who deal with long documents. It is also the only Apple program that allows simultaneous editing and printing.

The program manual is written in a tutorial style. The tutorials are a mix of step-by-step instruction and narrative discussion, a combination that does not seem to work as well as would splitting the two categories. The appendices give concise, complete descriptions of the varied package functions and features in alphabetical order.

Peachtree Software's **Magic Wand**, like WpDaisy, is a CP/M-based word-processing package. It allows spooling, and allows for unique "conditional" commands. These commands allow users to skip parts of a file, choose specific records for printing and store more than one document in a file.

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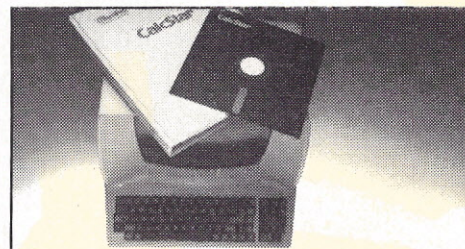
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CIRCLE 33

March 1982/Personal Computing

101

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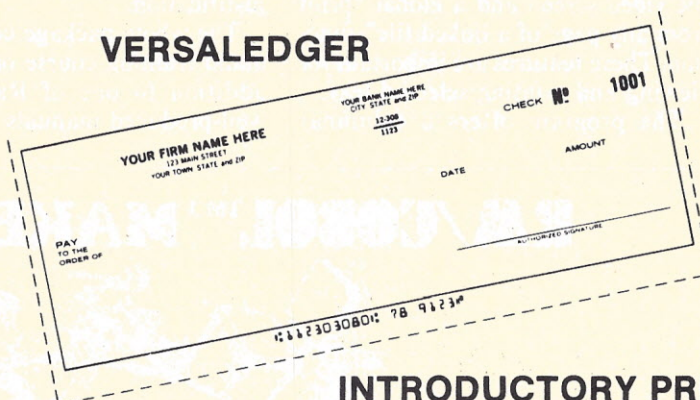
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originals, and automatically gives them the file name BAK, meaning backup. Until dumped, the back-up file remains the same.

Printing commands include negative indent or "undent," "ghost" hyphens, file chaining and almost every other advanced formatting command.

Professional Software's **Word Pro 4 Plus** is a word processor for Commodore CBM systems, and even Commodore recommends the package to its customers.

One of the program's best features is its "global search and replace," which searches and replaces character strings found on an entire disk, not just on one file or document. It has global copying, global output to the video screen and a global "print from any page of a linked file" function. These features are important for viewing and printing selected text.

The program offers a columnar

mathematics mode with numeric tabulation, addition and subtraction. It also offers three types of negative numbers or subtraction: a minus sign before or after the number and a number within parentheses. The **Word Pro 4 Plus** is also the only package that offers spooling or simultaneous input-output. The manual is an easy-to-understand tutorial.

Radio Shack's **ScriptSit II** for the TRS-80 Microcomputer Model II has added a number of advanced features to the original version. The package offers such advanced features as word and character swapping, horizontal scrolling and interactive search and replace. In addition, its formatter suppresses single-word lines at page ends during justification.

The whole package comes with an audio training course on cassette, in addition to one of Radio Shack's well-produced manuals.

Vector Graphic's **Memorite III** works on all Vector Graphic computers. It provides all standard word-processing features, including any desired format and several specialized functions.

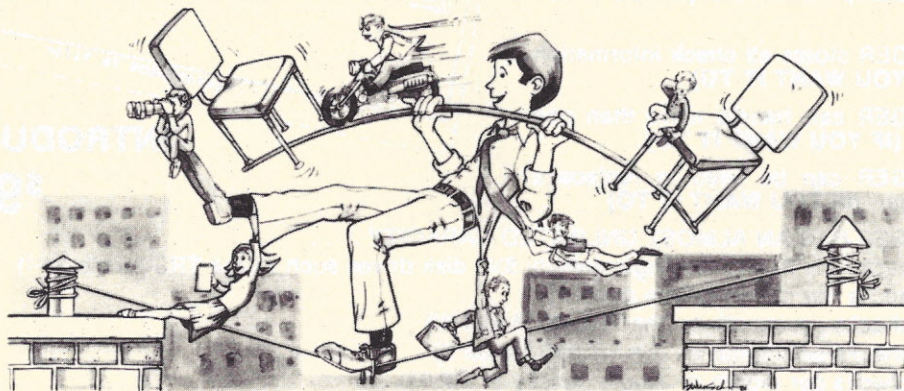
List management of several thousand names is provided, including sorting capabilities. These names can be merged with standard or custom letters, or on labels. The program can substitute whole phrases for previously designated abbreviations, and supports telecommunications.

The instruction manual is included in the software package, so any topic, the table of contents or the entire manual can be printed out on command.

The packages described above, which are listed in the buyers' guide, are available for every work style and pocketbook size. But the choice of a word-processing program must be made carefully.



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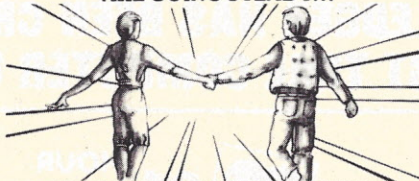
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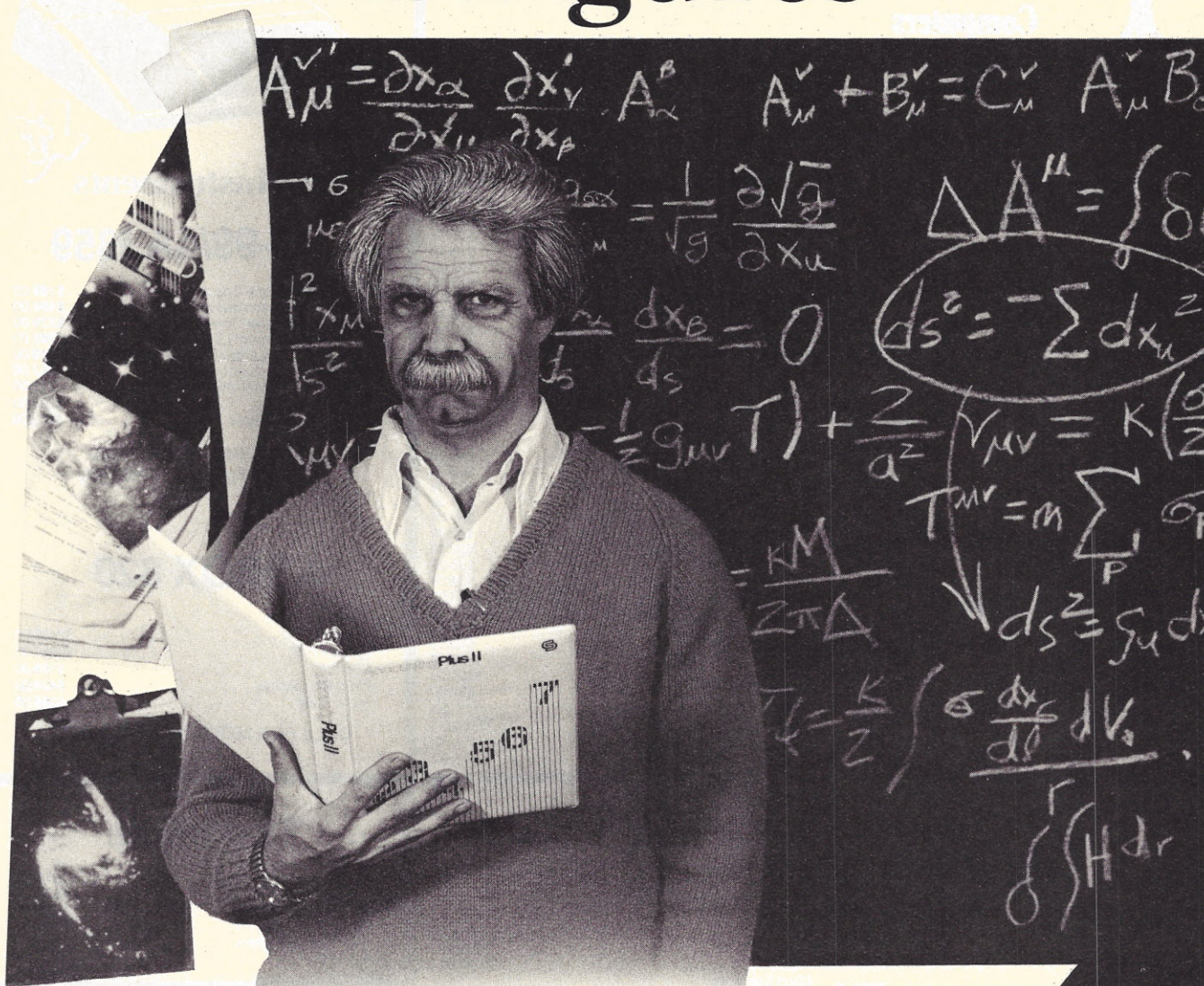
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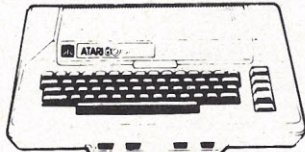
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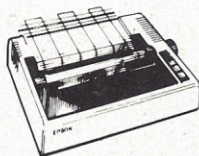
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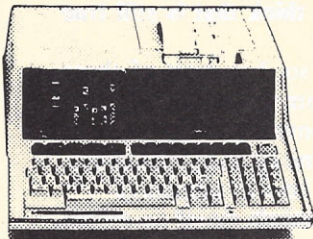
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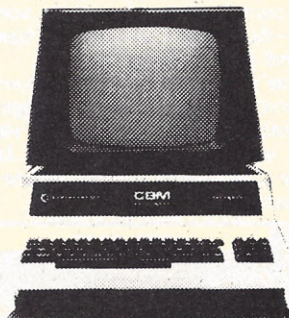
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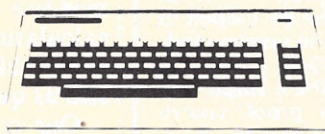


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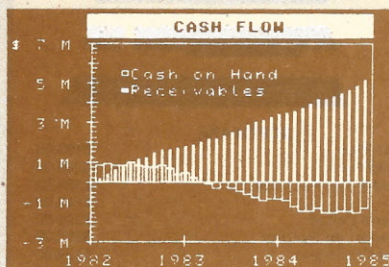
Interview with Bob Harp

continued from page 20

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04/22/82 COMPANY: Word Processing Services, Inc. Page 27

MODEL: Regular Growth STARTING: 08/82 ACTUALS: 03/83

20 Project Name	UNITS	EXPENSE	INCOME	CASH	W/C
MONTH 24 September 1982					
-11 Oper Expense	2.0	1.0000			
-72 Rental	1.0	200.00			
-10 General Overhead	2.0	400.00			
-05 Purchase	2.0	400.00			
-23 Hire	2.0	400.00			
20 Typing Service			4400.00	5275.00	
+00 New Product Service			8470.00	13285.00	
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40 Printing					
TOTAL		3817.00	55156.00	45231.00	62210.00

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Harp: I think so, too. I think that the IBM system will probably increase our sales. Sales of the IBM personal computers are projected at 200,000 in 1982. That's an awesome number of computers, and I think that they will definitely sell those machines. It's very easy for an executive in a company who has been using IBM mainframes to justify the purchase of a \$3000 or \$4000 IBM computer.

But one of the pieces of software that has really helped develop the marketplace is VisiCalc, which was the first electronic spread-sheet program of any significance. There had been dozens that were available on mainframes, but they didn't work the same way at all. Because of differences in the way the processor handles the screen in personal computers and in mainframes, VisiCalc is ideally suited for the personal computer and allows the user to update and modify a complex sheet of numerical calculations—something he would not be able to do on a mainframe system as quickly.

Our company has a similar program called ExecuPlan, which has a number of features such as the ability to extract data from other programs that make it especially flexible. And in terms of the marketplace, the beauty of these types of programs is that as the software evolves, a businessman is going to have less and less trouble justifying the purchase of a personal computer.

Gabel: What would you say is the reason for which the typical personal computer is purchased today?

Harp: It's bought as a dual-purpose machine—to have some fun but also to do some business. Typically the application is general ledger or accounting, or word processing. But it's clear that the computers that have the largest number of available games and offer impressive color graphics are the most popular, like the Apple.

Interestingly, though, there is another more exotic reason why people purchase personal computers—they come to it with the idea that they're

going to write a best-selling computer program and make a lot of money.

Gabel: Do you think that is still true today?

Harp: I think so, but most of those aspiring program writers lose interest before they complete the project, or can't really come up with the answer, or don't know how to market it.

Gabel: That reminds me of an article I read that referred to all the independent software authors for the IBM personal computer. It seems that anybody who has a personal computer can go into business for himself. Programming is one possibility, assuming that the person takes the time and effort to learn how to program.

Harp: Yes, probably the easiest business to get into is selling software. If it's a piece of software that's well executed and runs on a wide range of computers, it can be extremely successful. A leading software package will sell more than 1000 copies a month. So, we're talking about potential sales of a million dollars a year for an individual entrepreneur.

Gabel: And the only expense is the personal computer and his time.

Harp: There's also the cost of advertising. Successful software companies spend a great deal of money on advertising.

Gabel: Can you give me some examples of ways that people are beginning to use personal computers which were possibly considered too complicated a short while ago?

Harp: Inventory control is one. It can be very complicated, especially if you get into manufacturing and materials resource planning (MRP), but doing inventory control by personal computer can pay for itself several times over in the first year of use, considering that a typical store may have perhaps a million dollars or more in inventory. With today's high interest costs that's a great deal of money to have tied up. If one can optimize inventory with a computer, the savings are enormous.

It's a complicated software task that involves interaction between

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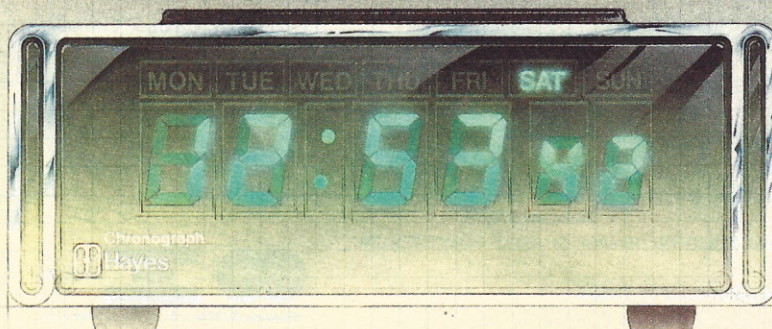
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CIRCLE 51

INTERVIEW

many different departments. The idea is to control everything about the entire operation, such as ordering the components, maintaining inventory levels, being able to hold the necessary mix of components to build a lot of product, and going further to include invoicing and so on. Without a computer this is a very difficult task.

On mainframes or minicomputers there are a number of excellent packages available. Right now there aren't many for personal computers, but Vector is involved in inventory software, and we're offering a package that we developed for our in-house use.

Gabel: How big a computer do you need for this inventory program?

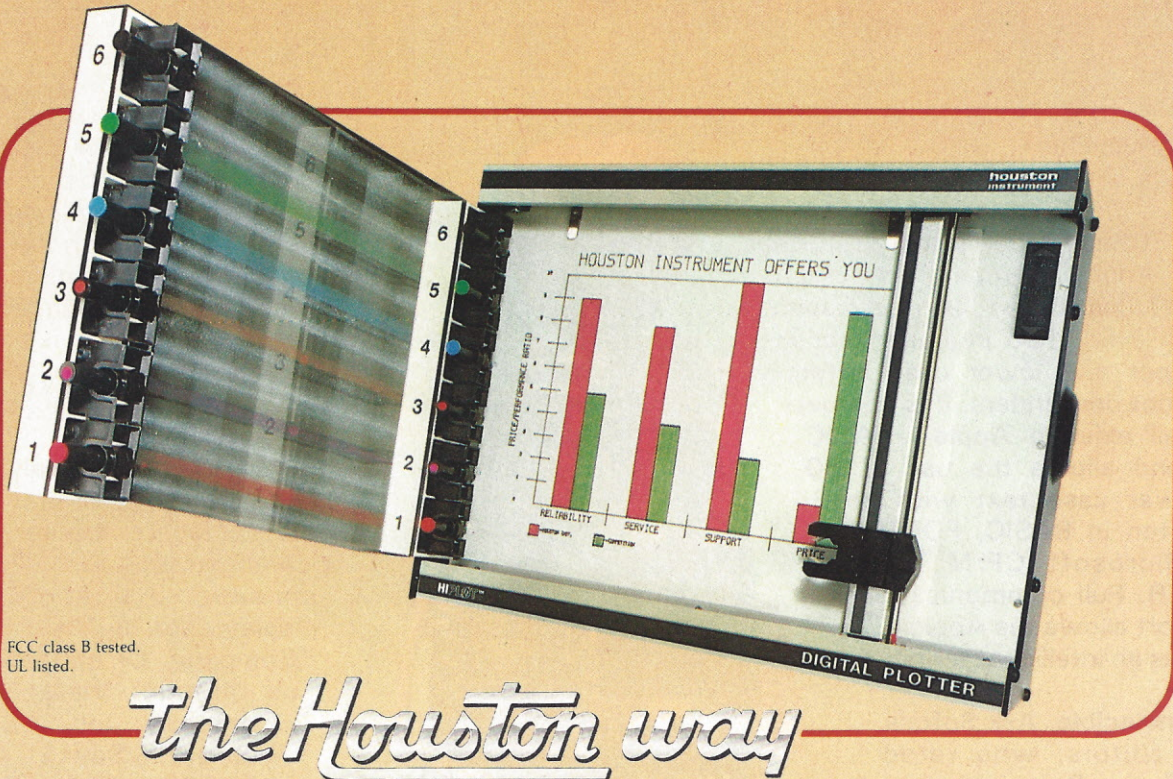
Harp: Size is not the problem because the program is modular. There are a lot of different modules that allow you to do things like create a bill of materials for a particular product, and the program explodes that bill of materials for you. If you want to build 100 units it gives you the quantities of each individual part. It then computes your inventory or stock on hand and determines if all those parts are in stock, and subtracts each requirement from the inventory level. The inventory levels that are below normal are then determined, and the program generates another list of items that have to be ordered. It's a never-ending job of juggling all that information.

Gabel: How about office acceptance of personal computers—is that an issue?

Harp: I think getting middle managers acclimated to computers is a big developing area. Generally these people have no familiarity with computers and are not about to learn programming, and they probably shouldn't have to. Their time is too valuable. The software has to allow them to accomplish certain tasks without knowing anything about operating systems or high-level languages.

The Xerox Star is an example of a computer that allows managers to get those tasks done without prior computer knowledge. Its commands are

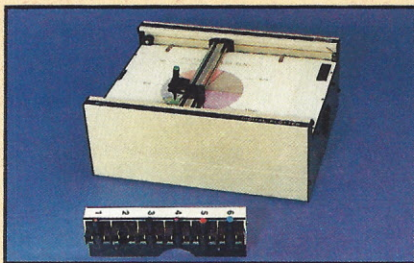
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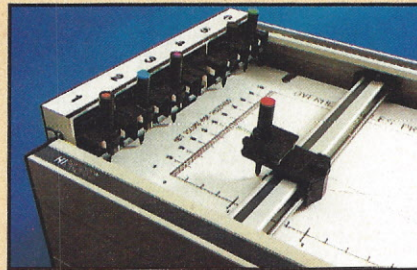
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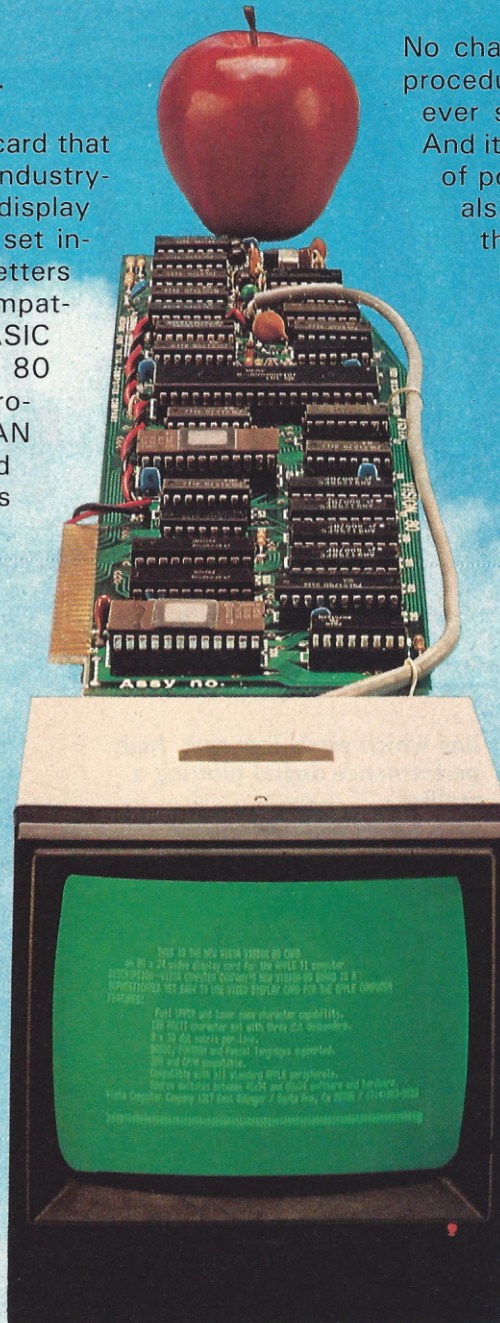
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what are called icons on the screen. They are little pictures of things to be done. For example, if the picture represents your input box, it looks like an input box; if the picture represents a file folder, it looks like a file folder.

You position the cursor using a device called a mouse that you roll around on the table. You position the cursor on any of those icons and you can look at your input box and read your mail, even though you're dealing with electronics rather than physical letters. If you decide to file a letter, you simply transfer it to your personal file folder, or to another appropriate file.

Gabel: Is there any kind of a move towards standardizing small computers?

Harp: The best move that was ever made was the de facto acceptance of CP/M as the operating system for the business world. But when you leave the eight-bit world and get into the 16-bit world, it's anybody's guess.

There are half a dozen good operating systems vying for that market, including CP/M-86, MicroSoft's DOS and Oasis.

Gabel: When this battle is finally won, how is it going to help the end user?

Harp: It's much to the end user's advantage to have a pool of software available. In the case of the eight-bit world there are thousands of programs available that run on CP/M. With some hardware modifications even non-CP/M machines like Apples can run CP/M-based software, but converting the machine is expensive.

Now the hope is that even though there are several different operating systems in the 16-bit world, there will still be compatibility between them, providing more software. This is the case with the CP/M-86 and MS DOS, the operating system on the IBM machine.

Gabel: Why do I need 16 bits in a computer?

Harp: You really don't. The most important advantage of going to a 16-bit processor is that it increases the addressable memory.

We ran some comparison tests with a 16-bit system and our eight-bit system. Our eight-bit system ran a benchmark program in BASIC almost twice as fast as did the 16-bit system. The benchmark took 36 seconds with the 16-bit processor and 22 seconds with ours. That really surprised us because we had assumed that the 16-bit processor would be faster. So the principal advantage is that you can use practically unlimited amounts of memory with the 16-bit processor, while the 64k limit that you have with the eight-bit processor has become a serious limit.

Gabel: So an eight-bit processor can do the same thing as a 16-bit processor—and maybe better—depending on the software.

Harp: At this time, yes. I think once the manufacturers really get into the

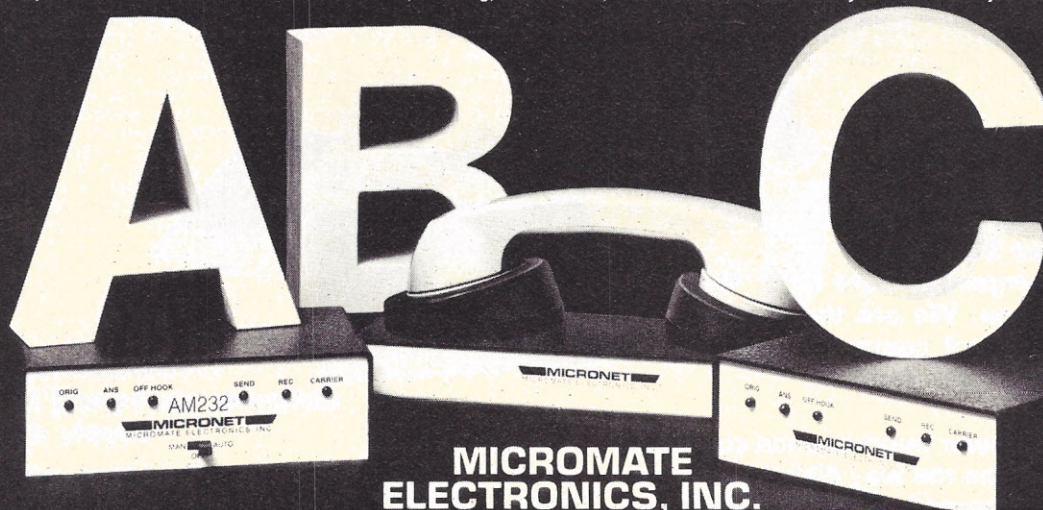
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high-level languages and optimize them for the bigger processors, they should be able to increase the speed. But some simpler computer functions, like word processing, are ideal applications for an eight-bit processor. ASCII character codes are seven bits long, and if you're dealing with 16-bit quantities, you're wasting word length.

Gabel: Do you think that consumers will be hyped on 16-bit machines?

Harp: Definitely. I would say that today the major reason to offer a 16-bit processor is for its marketing value. The transition to the 16-bit processor can be compared to the transition from the 8080 to the Z80. People wanted systems with Z80 processors and almost totally ignored 8080s.

Gabel: Because the Z80 is thought to be a better part or because it has been marketed well?

Harp: Because it has sex appeal. It's like something you want even though you don't know what to do with it.



People will buy a hi-fi system that outputs 200 watts even though they couldn't stand to be in the room with it if they turned it up all the way. But the intelligent consumer would do well to determine what he wants the machine to do, and make sure that the machine he buys can accomplish the task.

Gabel: What do you think is the future of personal computing?

Harp: I think the hardware is going to get a lot more sophisticated and a lot more powerful. I see machines going to 16-bit and larger processors. There are also three areas of technology that are expanding very rapidly. One is memory technology, another is processing technology and the third is disk technology. When we first started in business five years ago, the standard memory chip was 1024 bits. Now all of our products are being designed with 64k chips, and that will continue into the future. With processor technology you're increasing the speed and complexity and richness of the instruction set at enormous rates. But the inertia due to the large software investment is enormous. And with disk technology, right now most of our products are shipped with 5-inch Winchester disks that store 5 million characters. Within another year there will be 40 mil-

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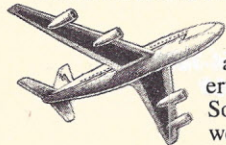
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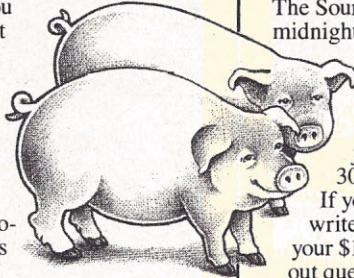
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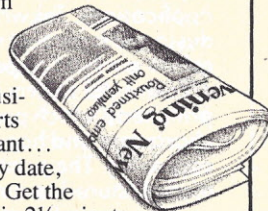
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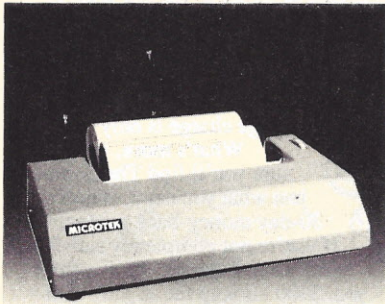
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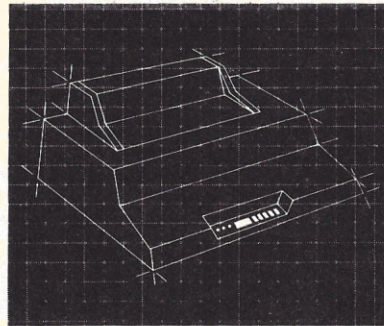
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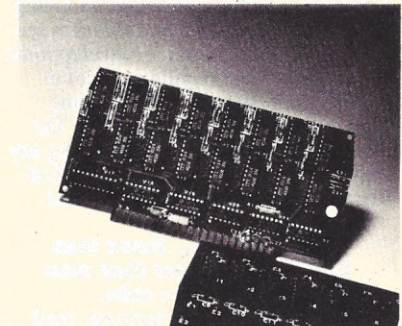
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Tekwriter-2 is especially well suited to handle word processing applications because of its data buffer expansion capabilities to 25K. This ability makes it an efficient graphics generator.

Parallel interface (Centronics type). Interfaces all models of TRS-80, Apple, and Atari 400/800, and most computers with Centronics printer interface.

\$695

Peripherals



16K Apple Memory Board

Expands Apple II to 64K RAM Memory. Works with MICROSOFT Z-80 Softcard, Apple PASCAL and Visicalc software.

16K-32K

Atari Memory Board

4116 RAM (200NS) Compatible with Atari 400/800

Parallel/Serial Data Buffer Converter

Interfaces with most computers and printers on the market today. Switch selectable parallel or serial input/parallel or serial output. Ideal for word processing and data communications. Data buffer 2K standard — expandable to 62K. Serial I/O BAUD rates switch independently selectable.

Atari Parallel or Serial Printer Cables

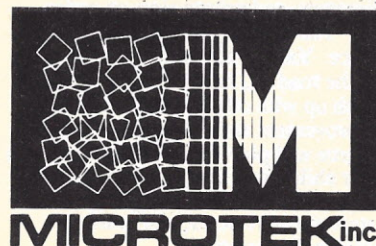
16K Vic-20 Memory Board

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CIRCLE 59

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INTERVIEW

lion characters in the same size package and at the same price we have been paying for 5 million.

Gabel: I didn't realize there were that many people who wanted a small computer with that much memory. Five megabytes seems like an incredible amount.

Harp: It seems like a lot but you fill it very rapidly. It's like Parkinson's law: Whatever data you have seems to expand and fill the available space.

Gabel: Will costs come down in other areas, too?

Harp: Sure. In the case of memory, the 16k memory chips that cost \$7 earlier are now available at slightly more than \$1. So there is a tremendous price erosion that works to our, and the customer's, advantage.

Gabel: Do you think the Japanese companies will come in and flood the personal-computing market?

Harp: I think it's a very good possibility, but it will take them longer than we anticipated. Generally, the Japanese strategy in penetrating any market is to go in with what they think is the right product, but it's often not suited for the American market. After the product has been on the market for a few years, they go back to the drawing boards and come up with a second-generation product and really take over the market.

The computer situation is a little different than that of cars. The Japanese really specialize in hardware manufacturing. The hi-fi is an example. The same thing will probably happen with computers, although the dichotomy between hardware and software is not as clear cut as it was with hi-fi systems. There are standards that define the characteristics of a decent hi-fi and its interaction with the record or the tape. So it's a very simple thing to design hardware that can play everything on the market. The same thing is not true with the computer. So it's not going to be an easy job, but they'll sure be trying.



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In addition to information retrieval, the VP-3501 provides full interactive communications with a host computer. What you have working for you is a versatile, feature-packed interactive data terminal which can be worth far more to you than its low price. Its unique color-locking circuitry gives you sharp color graphics and rainbow-free characters. You get 20- and 40-character formats in one of eight foreground colors and separate color backgrounds.

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For more information or to order, call toll-free, 800-233-0094. (In Pennsylvania, call 717-393-0446.) Visa or MasterCard orders accepted by phone. Or send a check including \$3.00 delivery charge plus your local sales tax to RCA MicroComputer Products, New Holland Avenue, Lancaster, PA 17604.

*Suggested User Price.



RCA

OUTLOOK

continued from page 16

Tax Saver II includes all of the features of the previous package, but also calculates Schedules C and SE, which include business income; and Schedule D, which includes capital

gains. Either version accepts totals from all other schedules.

The program runs on a TRS-80 Model I or II and requires a minimum of 32k and two disk drives. A

printer is optional.

Microtax

22713 Ventura Blvd., Suite F
Woodland Hills, CA 91364
(213) 704-7800

Micro-Tax

Micro-Tax offers three different packages designed for tax preparation, but the company considers only the Level I package suitable for the home user.

Level I is menu-driven with complete error trapping and help messages. It features 25 schedules including the 1040 and 1040A forms—all that any individual would need to complete his taxes effectively. It has interactive data editing, error checking and data can be replaced and recomputed so the program can be used for tax planning.

The program runs on all CP/M formats and requires a 24 x 80 screen display, a 56k memory, two disk drives and a printer. It prints on its own IRS substitute forms and also produces overlays. The price of the program is \$250.

Panasophics, Ltd.

Whistlestop Mall
P.O. Box 59
Rockport, MA 01966
(617) 546-3104

Application models

Panasophics offers application models that work with VisiCalc and SuperCalc software to do tax preparation, tax planning and financial planning.

The tax-preparation model incorporates all of the changes in the new tax laws, including the expanded tax tables and capital gains tax calculations to prepare the 1981 IRS form 1040. It prints pages one and two directly onto the form.

The tax and financial planning models allow the user to play "what-if" with his tax and financial situations. The tax models incorporate all of the changes in the tax laws through 1985, and allow for multiple scenarios to establish the greatest possible tax benefits.

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CIRCLE 31

One of the great masters?

Although the Datasouth DS180 matrix printer may not exactly rate as a work of art, our customers have a *very* high opinion of its value. Over the past year, we have shipped thousands of DS180 printers to customers throughout the world. Many of our sales now come in the form of repeat business—a strong testimonial to the acceptance of a product.

The success of the DS180 in a very competitive market did not happen by accident; rather through our sensitivity to the needs of the industry. This sensitivity we carry through research and development, production and quality control and finally, to after sales support and service.

Recently we introduced new enhancements to make the DS180 printer even more versatile. Dot addressable raster scan graphics produces output of computer generated charts, maps and graphs at a resolution of 75 x 72 dots per inch. Variable horizontal pitch selection allows printing at 10, 12 or 16.5 characters per inch plus double wide printing at 5, 6 or 8.25 characters per inch. The expanded 2K FIFO print buffer handles a full CRT screen dump at up to 9600 baud without delaying the host system. We also offer transparent mode for isolating communications problems, and for APL users, the dual ASCII/APL character set option.

Check our list of features and we think you will agree that the DS180 offers the most complete performance package in matrix printers.

DS180 PRINTER STANDARD FEATURES

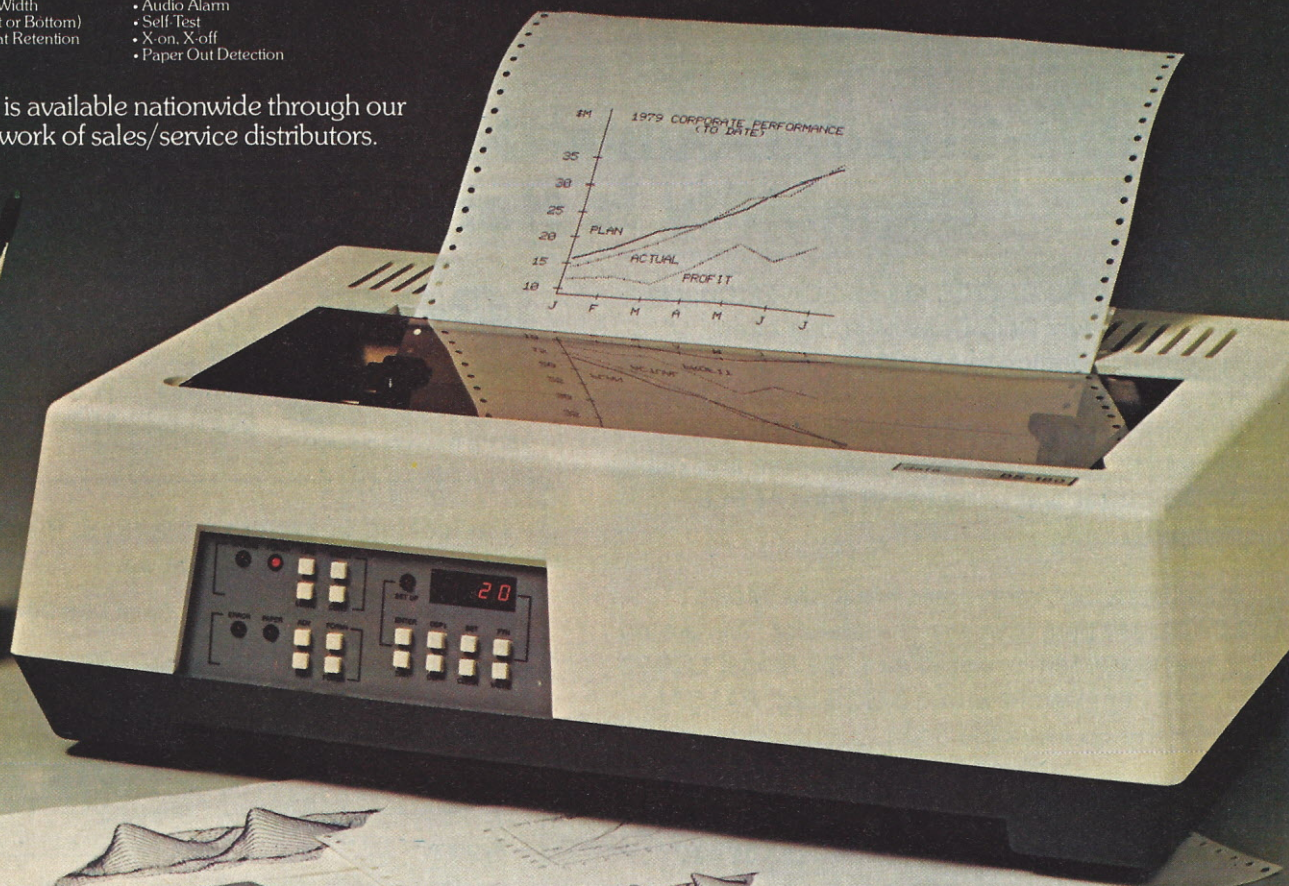
- Microprocessor Control
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- Expanded Characters
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- Top of Form
- Horizontal Tabs
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- Perforation Skip-Over
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- 110-9600 Baud Communications
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- Audio Alarm
- Self-Test
- X-on, X-off
- Paper Out Detection

OPTIONAL FEATURES

- Compressed Print—10, 12, 16.5 cpi
- High Resolution Dot—Addressable Graphics
- 2k Expanded Print Buffer
- APL/ASCII Character Set



The DS180 is available nationwide through our network of sales/service distributors.

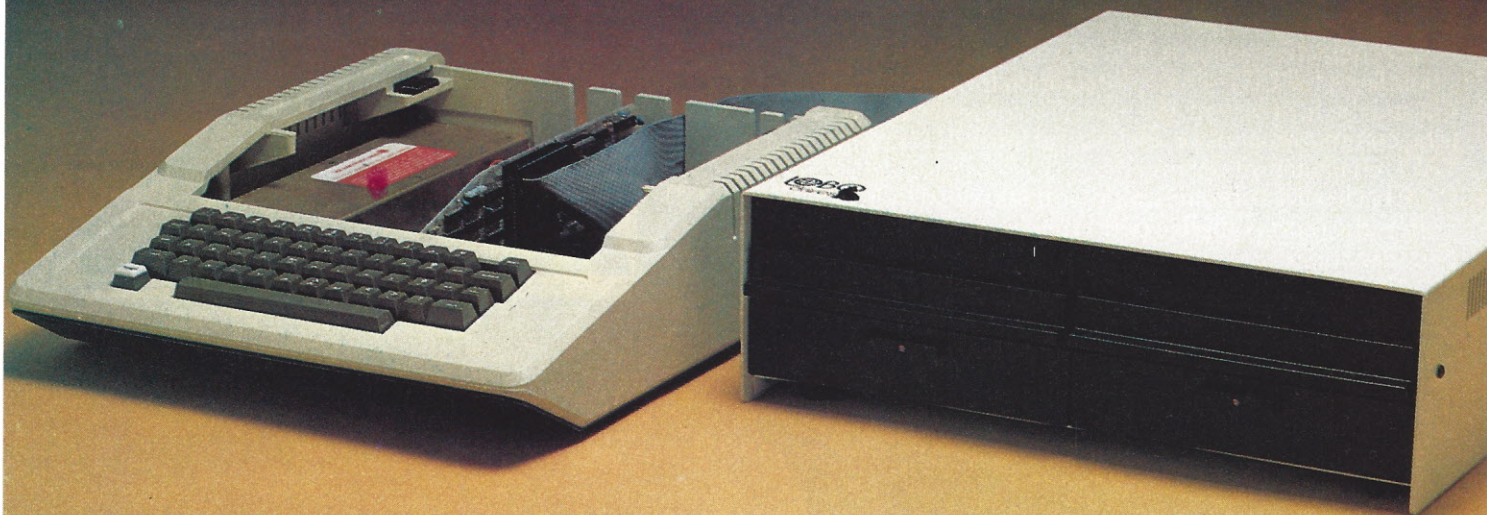


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CIRCLE 60

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Lawyer of the future

Ben Zander

There are surprised looks on the faces of many lawyers, judges and clerks these days when Richard "Red" D. Barker walks into court. Red seems to have stepped out of the 21st century to practice law in New Jersey: He has forsaken the traditional armament of the lawyer, the briefcase, in favor of an OSBORNE 1 computer.

The OSBORNE 1 is a portable computer that can be powered with a portable battery. When Red sits down to discuss a case, rather than rifling through mounds of paper, he selects from a set of three disks that contain either his "work-in-process file," or his "extended-case file."

On any given day, Red may handle from three to 12 hearings, motions or trials. "I no longer have to carry huge files in a separate clumsy arrangement," says the automated attorney. "Now, two or three disks can hold the entire contents of five to 10 files, and save me the 'fumbling time' needed to find important documents."

Using the computer also keeps Barker in closer touch with his home office in Woodbridge, N.J., where he has a TRS-80 Microcomputer Model II that "talks" to the OSBORNE 1. Updated files are transferred between his "portable" computer and the larger home-base machine, allowing Barker to keep current with all his files.

"Automation is the key to a lower overhead in a law firm such as this," he says. "We are then able to transfer that savings on to our customers."

While word processing has been used in many law firms, Red's computer is used for better record keeping. The average law firm is still "manually" run—it uses paper and calendar control of dates, deadlines, statute-of-limitations dates, etc. In Red's office, a file sorting routine allows for instant updates of each and every active file.

When interviewing clients, Red's desk is not littered with the usual legal pad, pencil and questionnaires. He uses a customized electronic "intake form" that leads him through the kinds of information he needs for a given case. For example, when a client wants to purchase a house, the real-estate-interview form is called up on the screen. While Red discusses the general nature of the transaction and the required documents, he is also inputting information about the clients and their case. That disk becomes the client "file," which will eventually con-



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Displays a complete disk sector in hex and ASCII using HI-RES screen • Edit sector by typing over display • Source listing provided.

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CIRCLE 62

OUTLOOK

tain all the information needed to close the property purchase.

Red travels with a portable Apple Silentype printer that uses thermal paper, has a modem and is capable of sending or receiving data from his OSBORNE 1 or through the telephone to his main office. At his main office, Red uses the Epson MX-80 printer. "What many people seem to worry about is the printer's "type quality." I'm more concerned with legibility and speed. With the Epson, we get both."

The Epson is a dot-matrix printer that forms the printed characters by firing closely spaced pins at a ribbon, which then prints to ordinary paper. Although the characters are not as attractive as the "letter-quality" printers, the Epson prints a great deal faster than any of the letter-quality machines. "I think that one day, if a legal document that is sent to court is output by a printer other than a dot-matrix, the recipient will think that your practice is inefficient," says Barker.

The arrival of the high-tech attorney seems to sit well with clients used to long delays and massive bouts with paperwork at every visit to a lawyer's office. As one of Barker's clients says, "Being able to see how my will was drafted and then to walk out with a completed draft copy was astounding."

Rating homes for energy use

A computer program introduced by Owens-Corning Fiberglas Corp. allows builders to provide potential home buyers the equivalent of "EPA mileage ratings" for a home's energy use. By plugging in a wide range of design and construction variables into the system, dubbed Energy Performance Design System (EPDS), a contractor can come up with a prediction of the number of energy units a house will consume annually. For a builder facing a disabled housing market because of mortgage rates and an energy obsessed nation, that kind of consumer information could provide him with an edge on his competitors.

To use EPDS a builder plugs pertinent architectural specifications and any of hundreds of construction options into the computer. What comes out is the lowest energy-use target for the specific home design, which takes into account its region, area, climatic conditions and the like; the energy

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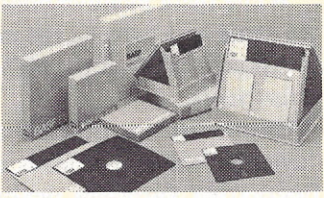
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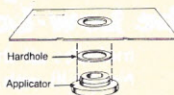


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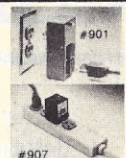
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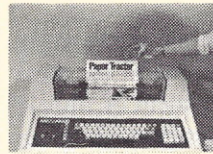


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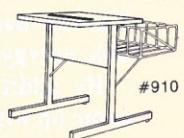
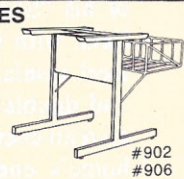
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956	Complete package for Commodore VIC	\$159.00
957	Package for Atari	\$159.00
958	Deluxe package for Apple	\$349.00

*NOTE: Atari users require the Atari 850 Interface Module and Atari's Telelink Cartridge.

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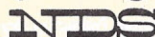


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performance potential of any current or planned design; and a determination of those many design and construction options that should be incorporated into the home to bring projected energy use down to the low target.

One Wisconsin contractor, eyeing the housing field, turned to EPDS to redesign one of his more popular home-styles. Ed Gehl, president of Impala Homes in Madison, Wis., fed the computer program a steady diet of questions concerning the energy use of his "Sheffield" home. And although the Sheffield, with its heavily insulated ceilings and walls, steel insulated doors, polyurethane vapor barriers and double glazed windows, would not be considered an energy hog, the computer projected that the home's energy performance was nearly 20,000 kilowatt-hours annually—or twice what an obtainable energy goal would be.

By additional data crunching in EPDS, Gehl came up with a series of design modifications aimed at cutting the home's energy use in half. Among the

modifications were: higher roof height and thus, better distribution of attic insulation; triple glazed windows; wider beams and increased wall insulation; more insulation in the basement walls; and additional caulking and weatherstripping throughout the home.

While these modifications will add to the cost of the home by 5 percent, the increased energy savings is expected to offset the higher upfront price within a few years.

Owens-Corning officials describe the system as "dynamic" in that it takes into account numerous fluctuating variables dealing with weather and home size that enables the computer to come up with an accurate energy representation.

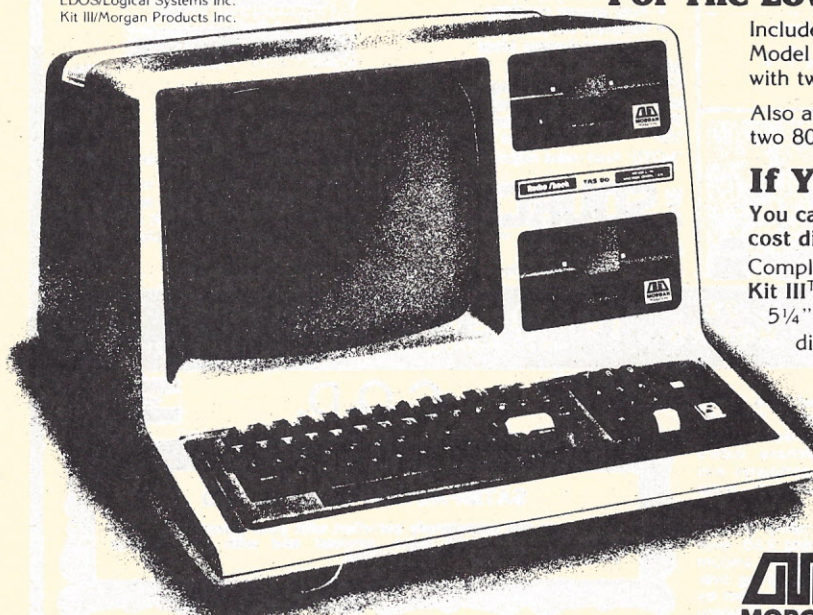
For Gehl it is too soon to say whether his Sheffield design with EPDS dictated modifications is significantly more energy efficient than homes he has built in the past.

"The Madison home was completed in July," Gehl says, "and the first few months have shown

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that the home used a surprisingly small amount of energy. But a very mild fall has put a modest heating load on the home."

Still, Gehl is optimistic because his business now owns the bragging rights to offering more to the consumer, always a significant achievement in itself in a failing market.

"People used to ask me how much taxes would cost them," he says. "Now they ask me how much energy the home will use. While I still can't come up with an exact figure, I can give them an approximation with EPDS. And if my home is a strong energy performer, EPDS may give me a marketing edge."

Additional information on EPDS can be obtained from Owens-Corning Fiberglas Corp., Fiberglas Tower, Toledo, OH 43659; (419) 248-7351.

Outbid your computer

Editors' note: After the accounts have been received and paid, the words processed, the inventory controlled, the Visi Calced and whatever else one wishes to do with personal computing, there still remains the possibility of playing a computer game. The editors of this column will present tidbits of the game world from time to time.

Thomas Throop

A computer bridge game presently on the market is the Bridge Partner, written by George Duisman and distributed by Personal Software in Sunnyvale, Calif. The program is written for the TRS-80 Model I, Level II.

The Bridge Partner offers three ways of creating deals for play. First, you may input a random number into the program to generate the first deal in a series of deals. You may then specify which deal within that set you wish to play. Second, you may set up your own deal by specifying exactly which cards will be in all four hands. Third, you may generate deals which meet your specified requirements for the minimum and maximum number of high-card points in the hands of both you and your partner. Deals created in any one of these three ways may be saved on a cassette for future play.

Once a deal has been created in one of the three ways, you, as the declarer, play the North and

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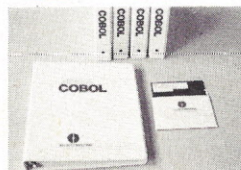
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CIRCLE 68

March 1982/Personal Computing

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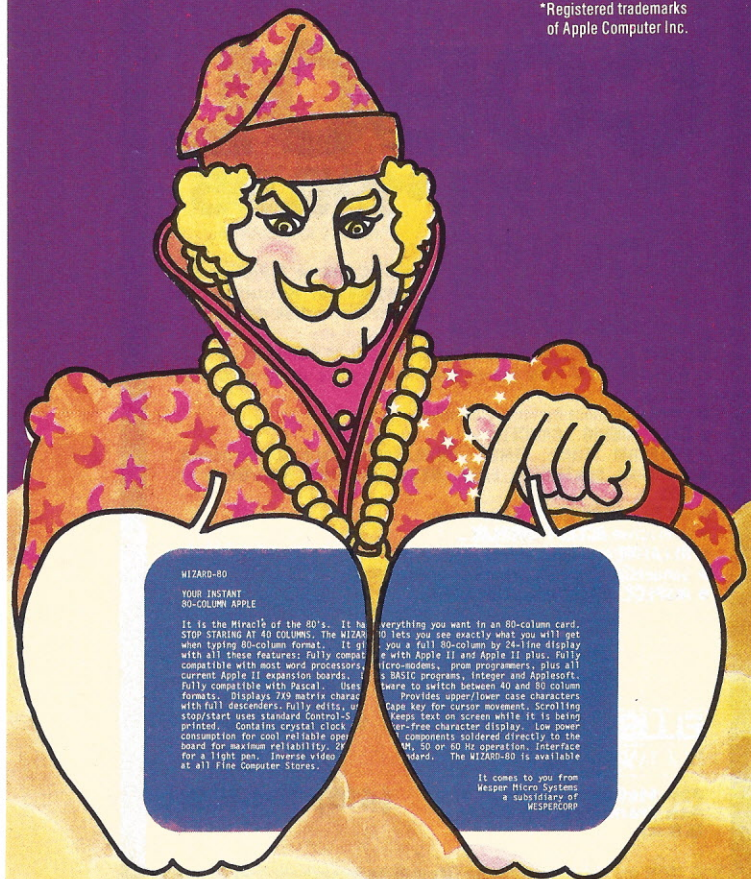
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CIRCLE 70

OUTLOOK

South hands at a contract of your choice. The computer defends with the East and West cards. When a deal has been played, you may replay the same deal, play a deal in which the North-South cards remain the same but the East-West cards are redistributed, or play a completely new deal.

In a sample game, deal 52 of set 3.65 is shown in figure 1.

Figure 1

NORTH (Dummy)

S KQJ
H 73
D KT4
C A9863

SOUTH (Declarer)

S AT8542
H 54
D J3
C J74

Suppose you elect to play 3 spades with these cards, which is a bit ambitious but not unreasonable. The computer program, as West, opens the 2 of hearts against your contract. You play the 3 from dummy, and East plays the 6. At the table East would play a much higher card, but the program knows that the 6 is high enough. East then cashes the ace of hearts. At trick 3, East continues with the 9 of hearts, which gives you a sluff and a ruff.

After the last play by East, you have some choices. It is probably best for you to discard a club and ruff in dummy. Then cash dummy's king of trump, and both East and West follow small. Then play the queen of spades and overtake with your ace, since you wish to be in your hand after drawing trump. East shows out of trump, discarding the 10 of hearts. Next, cash your 10 of trumps to pick up West's 9, discarding a club from dummy.

Now it is time for the diamond finesse; you hope that West has the queen of diamonds. You lead the jack of diamonds, and West plays small, which is an incorrect play. You play small from dummy, and East wins the trick with the ace of diamonds.

At this point, the proper defense for East is to lead a club away from his king, but that's fairly sophisticated for this program. The program, as East, plays the 8 of diamonds. You follow with the

3, West plays the queen, and you win with dummy's king. Now dummy's 10 of diamonds is good, on which to discard the remaining club loser in your hand. The rest of the tricks are yours, and you end up making 10 tricks for 1 overtrick.

This complete deal and the play of the cards are shown in figure 2.

Figure 2

NORTH
(Dummy)

S KQJ
H 73
D KT4
C A9863

**COMPUTER
WEST**

S 973
H QJ82
D Q9765
C Q

**COMPUTER
EAST**

S 6
H AKT96
D A82
C KT52

SOUTH
(Declarer)

S AT8542
H 54
D J3
C J74

	W	N	E	S
Trick 1	2H	3H	6H	4H
2	8H	7H	AH	5H
3	JH	JS	9H?	4C
4	3S	KS	6S	2S
5	7S	QS	TH	AS
6	9S	3C	KH	TS
7	5D?	4D	AD	JD
8	QD	KD	8D	3D
9	6D	ID	2D	7C
10	QC	AC	2C	JC
11	QH	6C	5C	4S
12	7D	8C	TC	8S
13	9D	9C	KC	5S

Contract: 3 spades

Tricks N-S: 10

Tricks E-W: 3

Maryland-based Thomas Throop has been working with computers for thirty years, since the days of the Univac 1.



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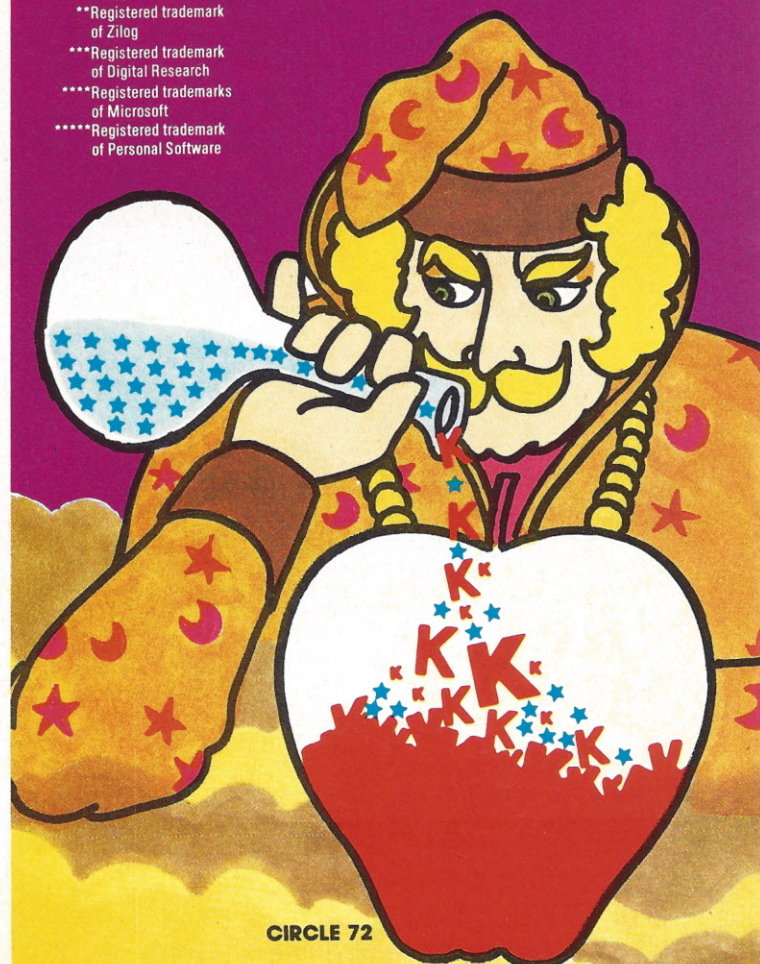
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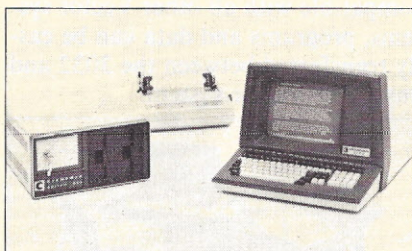
Targeting the market

With the introduction of the System One computer, Cromemco is making a bid in the personal-computer market. The computer offers sophisticated features and performance capabilities, and was designed for both multi- and single-user applications. This provides for substantial expansion room, allowing the unit to be configured to meet individual requirements.

System One is particularly suited to business applications and a wide range of professional applications including engineering, science, medicine and education.

The company is also providing software support for the System One with a number of end-user oriented packages. Its "Master" software series, including Writemaster, Slidemaster, and the Data-Base Management System (DBMS), is designed specifically for business applications. Writemaster is a display-oriented word-processing program, Slide-

master is a tool for creating graphics and text displays, and the DBMS package provides data-base management capabilities along with a report-writer feature.



The basic System One is provided with Cromemco's Z80A-based CPU, 64k of RAM memory, a printer interface and dual quad-capacity 5-inch floppy disk drives. The drives provide 780k of storage capacity.

The 8-slot card cage included in the System One provides room for expansion. Consequently, the system can be configured for specific requirements by adding additional memory and I/O cards. The comput-

er includes system diagnostics, which enable a quick test of the system to see that the memory, controller and disk drives are functioning properly.

The System One is designed for use with 110/220 volt 50/60 Hz power. Voltage selection is user-selectable by means of push-button switches on the rear panel of the machine.

In addition to business-oriented, end-user software, Cromemco provides a range of system software for the machine. Currently available software includes Structured BASIC, FORTRAN, COBOL, C, RATFOR and LISP. The company also offers a choice of operating systems including its CROMIX multi-user, multitasking operating system.

The price of the System One (Model CS-1) is \$3995.

For more information: Cromemco, 280 Bernardo Ave., Mountain View, CA 94043; (415) 964-7400.

CIRCLE 200

Reaching businesses

The Victor 9000 computer is aimed at the small- and medium-sized business market, professional organizations and companies with many decentralized applications.

The system has a 16-bit microprocessor, allowing it to execute complex programs. It comes with 128k and is internally expandable to 256k or 512k. "This means that the user can literally, right from the box, take advantage of more complex programming without the need of costly, additional memory expansion or time-consuming program overlays," says Edwin F. Carlson, president of Victor Business Products.

The Victor 9000 is also equipped with a disk capacity of 1.2 megabytes and offers human engineering features. These features include a professional, typewriter-size detachable keyboard, a user-defined function key to simplify program operation,



and a standard numeric 10 keypad for data entry. The system has a tilt and swivel CRT to accommodate a variety of viewing positions, and the display component is detachable for individual positioning.

One feature of the display screen is

a dual-format. In the normal format, it approximates a typewritten page with 80 characters in each line. In its expanded format, under program control, the character generator displays 50 lines with 132 characters on each line for when a large number of columns must be analyzed together, as with a financial spreadsheet. The screen simultaneously displays high-resolution graphics, bar charts, pie charts, diagrams and schematics.

The high-resolution, glare-free Victor 9000 screen can address 800 dots horizontally by 400 dots vertically, allowing the system to display characters in many different character fonts and languages.

The price of the Victor 9000 is \$4995.

For more information: Victor Business Products, 3900 North Rockwell St., Chicago, IL 60618; (312) 539-8200.

CIRCLE 201

HARDWARE UPDATE

SYSTEMS

Faster Execution

The 3032 computer system for business and professional use contains 32 megabytes of Winchester disk storage and a Z80b, 6 Mhz microprocessor to increase system performance.

The computer uses an 8-inch Winchester disk to provide a formatted 32 million characters of storage, enabling full use of the maximum size files allowed by the CP/M 2 operating system. The 3032 can use all of Vector Graphic's CP/M-based application and development software, including Memorite III word processing and mail-list management, accounting and business communications, ExecuPlan Financial planning and forecasting software.

The 3032 uses Vector's DualMode

disk controller which provides automatic error detection and correction. A 630k floppy disk is incorporated in the same module as the Winchester, and is identical to the floppy disk used in other Vector systems. Since software run on the 3032 is directly compatible with all other Vector systems, programs and data can be easily transferred between the 3032 and any other Vector system.



Either the Vector 3500 or 7700 letter-quality printer can be used with the system. An RS-232-C serial

port is provided as a standard feature. The price is \$12,795.

For more information: Vector Graphic, 500 N. Ventu Park Rd., Thousand Oaks, CA 91320; (805) 499-5831.

CIRCLE 202

Eliminating Problems

The Eagle II computer is designed specifically to eliminate programming complications for users. The operator simply selects the appropriate software package included with the computer, and the system can be used as an accounting system or as a word processor.

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CIRCLE 54

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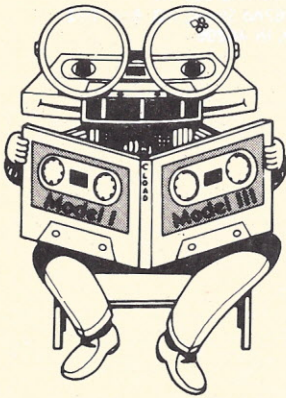
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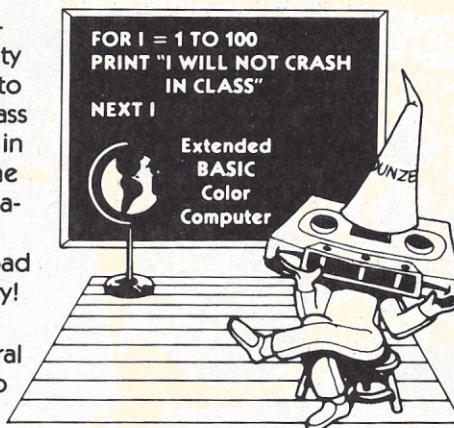
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CIRCLE 76

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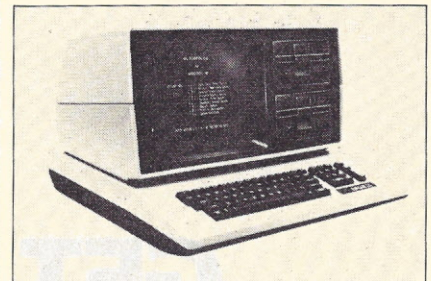
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CIRCLE 79

HARDWARE

expediting financial-record updating
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For more information: Tran-
snational Computer, 1545 Old Bay-
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Engineering and Test Applications

The HP 9836A computer is aimed
at enhancing computer-aided en-
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applications. It enables the user to
gather, interpret and graphically dis-
play data quickly; increases the range
of computer-aided engineering-
application possibilities; and makes
the CAE solution more affordable.

Display enhancements include
underlining, inverse video, blinking,
and a half-bright and half-shifted dot
scheme that improves character
legibility.

The unit is equipped with a 12-inch
CRT screen and dual 5¼-inch flex-
ible disk drives. There are also six
options which include: HP standard
Pascal programming, VisiCalc soft-
ware, an HP 98627A interface card



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automatic retransmission for demanding business applications. Transend 3 incorporates electronic mail—with password security, text editing, mailbox with mailstop, untended scheduling and receiving, automatic redialing, and much more.



The Transformation People

CIRCLE 49

Transend's support of most popular Apple II "add-in" cards and modems lets you upgrade your Apple without hassle or unnecessary expense. And you'll immediately cut operating costs by as much as 30% with simple, easy-to-use menus, data compression and 1200-baud modem support.

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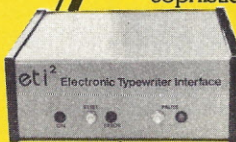
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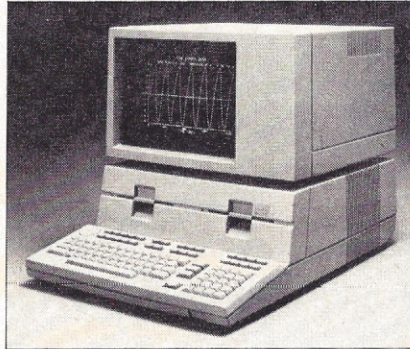
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(213)475-9949

HARDWARE UPDATE

(color/monochromatic graphics), powerfail protection, and an HP 98256A 256k random-access memory card.



The computer has optional data communications capabilities that provide asynchronous data communications and HP data-link capabilities.

System prices are under \$16,000 depending on configuration.

For more information: Inquiries Manager, Hewlett-Packard, 1820 Embarcadero Rd., Palo Alto, CA 94303.

CIRCLE 204

For more information: Scott Instruments, 1111 Willow Springs Dr., Denton, TX 76201; (817) 387-951.

CIRCLE 205

Stackable Calendar/Clock

The Hayes Stack Chronograph is an RS-232-C compatible calendar/clock that adds time-keeping to personal-computer systems. It is a stand-alone unit in an aluminum case with a large display for time, date and weekday reporting. The display also features quartz-crystal control and low-battery, write-protect and alarm indicators.



With the Chronograph and user-developed software, a computer can log programs and reports by day, time and date. Using the computer-alarm feature, the unit can also provide a computer with information necessary to control lights, burglar alarms and sprinkler systems. To cut the cost of electronic mail, the user can combine the Chronograph with a modem and computer, and develop programs to batch daytime messages and send them at night when telephone rates are lowest.

The Chronograph reports the time in hours, minutes and seconds in 12- or 24-hour modes. The date is output in a year, month, day format with automatic leap-year adjust. The weekday is output as a single digit.

The price is \$249.

For more information: Hayes Microcomputer Products, 5835 Peachtree Corners, Norcross, GA 30092; (404) 449-8691.

CIRCLE 206

Electronic Notepad

The Model EX-1650 produces full-size hard-copy output directly from

PERIPHERALS

Voice-Entry Terminal

Shadow/VET is a voice-entry terminal that interfaces directly with any Apple II computer. Using the terminal, the user can run integer BASIC, AppleSoft, machine-code and Pascal programs by voice input, making no modifications to the programs. It also makes all of the Apple's internal random-access memory available, providing fully integrated speech-recognition capability without the need for accessing any of the computer's own memory.

Shadow/VET is linked functionally to the Apple's keyboard, and the operator can use keyboard input or voice input at any time. It is supplied with pre-processor, interface board with 16k of on-board RAM memory, software, noise-cancelling headset microphone and operator's manual.

The price of the terminal is \$995.

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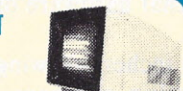
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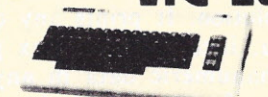
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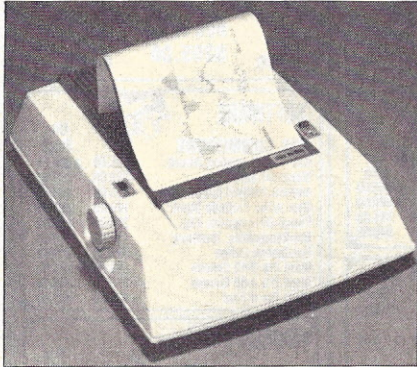
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HARDWARE UPDATE

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The printer operates from the composite video information being displayed on the screen, and requires

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Paper width is 8 1/2 inches, allowing full-size reproduction of forms, reports and graphs. The patented printhead is self-adjusting and requires no maintenance. The use of electrosensitive paper eliminates warm-up time, inks, ribbons, toners and chemicals.

The price is \$3495.

For more information: Axiom Corp., 1014 Griswold Ave., San Fernando, CA 91340; (213) 245-9244.

CIRCLE 207

COMMUNICATION

Modem for PET and CBM

The Microconnection is a direct-

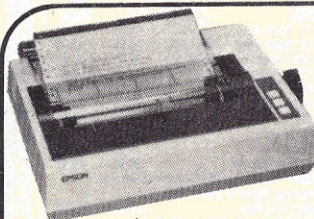
connect modem for Commodore PET and CBM personal computers.

The modem serializes the data in software and toggles the data bus with ASCII data at 300 baud. It operates at full or half duplex in the originate or answer modes. The word length, parity selection and number of stop bits are software selectable. Provision is made in the modem for spooling data to a cassette recorder for storage, and the information in ASCII may be played back through the modem at a later time.

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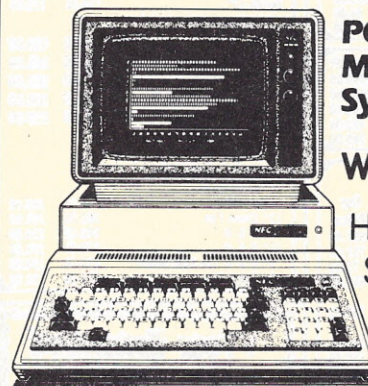
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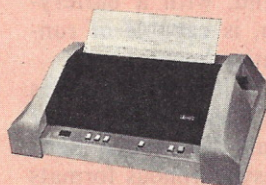


- 18 x 9 dot matrix; suitable for word processing • Underlining • proportional spacing • right margin justification • serif typeface • 80/100 CPS • 9 1/2" Pin Feed/Friction feed • Reverse Platen • 80/132 columns • Top of form

CENTRONICS 739-1 (Parallel) (List \$955) \$Call
CENTRONICS 739-3 (Serial) (List \$1045) \$815
GRAPPLER™ Apple graphics interface \$Call

ANADEx

Dot Graphics, Wide Carriage

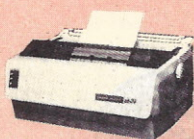


- 11 x 9 dot matrix; lower case descenders • Dot resolution graphics • Bi-directional, logic seeking • Up to 200 CPS • RS 232 Serial & Parallel • Forms control • X-ON/X-OFF • Up to 6 part copy.

ANADEx 9501/9500 (List \$1650) \$Call
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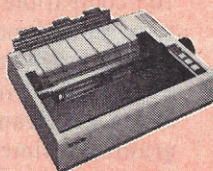


- 9 wire printhead (460) with lower case descenders • Over 150 CPS • bi-directional, logic seeking • 8 character sizes; 80-132 columns • Adjustable tractors • High-resolution dot graphics • Proportional spacing & text justification

IDS 460G 9 wire printhead, graphics (List \$1094) \$Call
IDS 560G wide carriage, graphics (List \$1394) \$Call
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GRAPPLER™ Apple graphics interface \$Call

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GRAPPLER™ Apple Graphics Interface \$Call

GRAFTRAX 80 - MX80 Dot Graphics \$ 95



NEC 8023 DOT MATRIX

- Dot graphics • 100 CPS • Bi-directional, logic-seeking • Tractors & friction feed • 5-Alphabet fonts • 8 character sizes • Proportional spacing

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CIRCLE 64



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HARDWARE UPDATE

peripheral Corp., 2643 151st Place N.E., Redmond, WA 98052; (206) 881-7544. **CIRCLE 208**

Communicating Terminal

The Infone is a portable telecommunications terminal that performs both voice and data communication functions.

Infone can be used as a standard voice telephone with its electronic handset. Directories of names and telephone numbers can be stored and then automatically dialed with a few keystrokes from the 51 button keyboard. The unit also tracks the cost of the call in progress and accumulates charges against directory entries for later accounting.

As a text and data terminal, Infone

sends and receives data from time-sharing computers or personal computers equipped with Bell 103-compatible modems. Infone contains an LSI modem, allowing direct connection to the dial network for data calls. Files can be created, stored and transmitted at a preprogrammed time to reduce communication costs. The device also automatically answers a call, records data and stores them for later use.

In addition to its other features, Infone can control a cassette recorder, a 40-column thermal printer, an external speaker and a folding acoustic modem adapter for pay phones. The unit also acts as a programmable master controller for BSR appliance modules.

The price is \$1150, which includes a handset, acoustic adapter, desktop stand and 6k of user memory.

For more information: Novation, 18664 Oxnard St., Tarzana, CA 91356; (213) 996-5060. **CIRCLE 209**

Signaling the Computer

Signalman MK1 is a Bell 103-compatible modem that interfaces to any RS-232-C port with a built-in RS-232-C cable, allowing total flexibility with the widest range of personal computer systems. The unit is also portable and, with a battery-powered system, is capable of running 50 consecutive hours.

Priced at \$129, the unit includes automatic mode selection (originate/answer) and a talk-data switch. Serial binary and asynchronous formats operate at data rates of 0-300 bps, with full duplex.

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CIRCLE 44



Leisure Genius

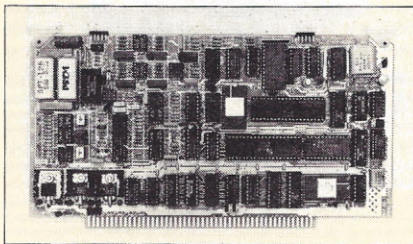
For more information: Anchor Automation, 16130 Valerio St., Van Nuys, CA 91406; (213) 997-6493.

CIRCLE 210

BOARDS

Talking to Mainframes

A wide range of personal computers can talk to mainframes over a standard dial-up phone line using a high-speed S-100 telecommunications controller.



The new interface, called M/LINK, accommodates error-free data transmission at 2400 bits-per-second using the Bell 201C standard, and allows alternate data and voice communications. SLDC or Bi-Sync communications protocols are PROM-selected at the time of installation.

M/LINK provides synchronous half-duplex operation, since the bandwidth limitations of the phone line do not permit full-duplex operation at 2400 bps. The interface provides DTMF (Touch-Tone) or pulsed-line dialing, and features auto-dialing and auto-answer capability.

The price is approximately \$1500.

For more information: Micro-mation, 1620 Montgomery St., San Francisco, CA 94111; (415) 398-0289.

CIRCLE 211

High-Capacity Memory

A high-capacity memory-expansion board allows users to directly address up to one megabyte of memory on the IBM Personal

Computer. The board contains up to four times the amount of memory currently available for the IBM machine.

The board can be configured in a variety of sizes: 64k, 128k, 192k and 256k—with parity. Prices start at \$499 for the 64k version.

For more information: Datamac Computer Systems, 680 Almanor Ave., Sunnyvale, CA 94086; (408) 735-0323.

CIRCLE 212

PET/CBM Interface

The Multi-purpose interface is a three-in-one interface for PET and CBM computers. The board provides: a video monitor connector that lets a user display whatever is on the screen on a video monitor; a sound adaptor with built-in amplifier,

speaker and volume control; and an audio tape recorder control which lets the user add recorded messages to his programs and puts starting and stopping of a cassette recorder under program control.

The interface plugs into the back of the PET/CBM. It can also be clamped from inside the PET so it cannot be removed. The price is \$109.95.

For more information: Teaching Tools: Microcomputer Services, P.O. Box 50065, Palo Alto, CA 94303; (415) 493-3477.

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BITS & PIECES

Apple Protection

The Apple-Center houses an Apple computer, a 9-inch monitor and two

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CIRCLE 90

HARDWARE UPDATE

disk drives. It also protects the computer from voltage surges and contains a cooling fan.



The unit incorporates a key locking on/off switch to prevent unwanted use, storage for diskettes and a flat top for a printer or monitor.

The price is about \$275.

For more information: Doss

Industries, 1224 Mariposa St., San Francisco, CA 94017; (415) 863-9161.

CIRCLE 214

Reducing the Clutter

The Applekart is a piece of computer furniture designed to fit most personal-computer systems.

Design elements include a pull-out work station, two "pop-up" side work areas, a complete electrical system with external light indicator, wheels for easy mobility and ample storage.

The price is \$429.95, or \$439.95 with a lock.

For more information: System Solutions, 16783 Beach Blvd., Huntington Beach, CA 92647; (714) 963-7860.

CIRCLE 215

Storage Package

Opus Pak is a combination storage and protection kit. It includes a supply of 10 Opus diskettes and an Opus

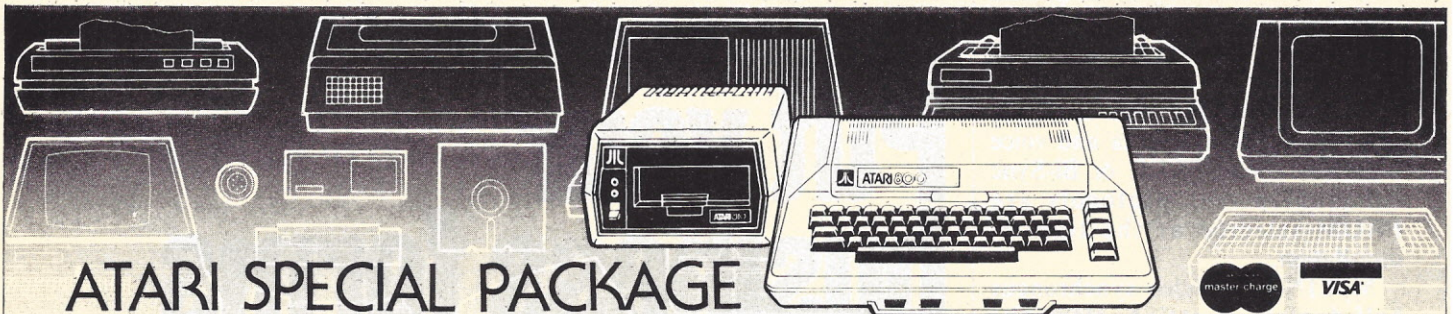
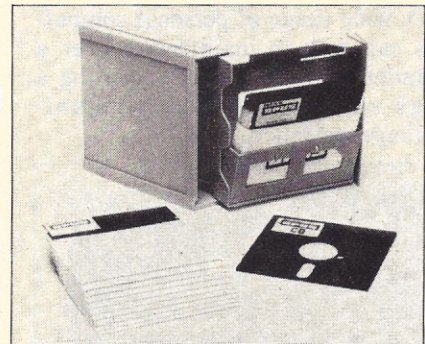
CD Head Cleaner that can be used for six months.

The case comes in two sizes for 5¼-inch or 8-inch diskettes. One of its features is its interlocking capability which permits the building of vertical and horizontal filing cases.

The price is \$54.95.

For more information: Computer Resources, 4560 W. 160th St., Cleveland, OH 44135; (800) 391-9330 or in Ohio (216) 362-1020.

CIRCLE 216



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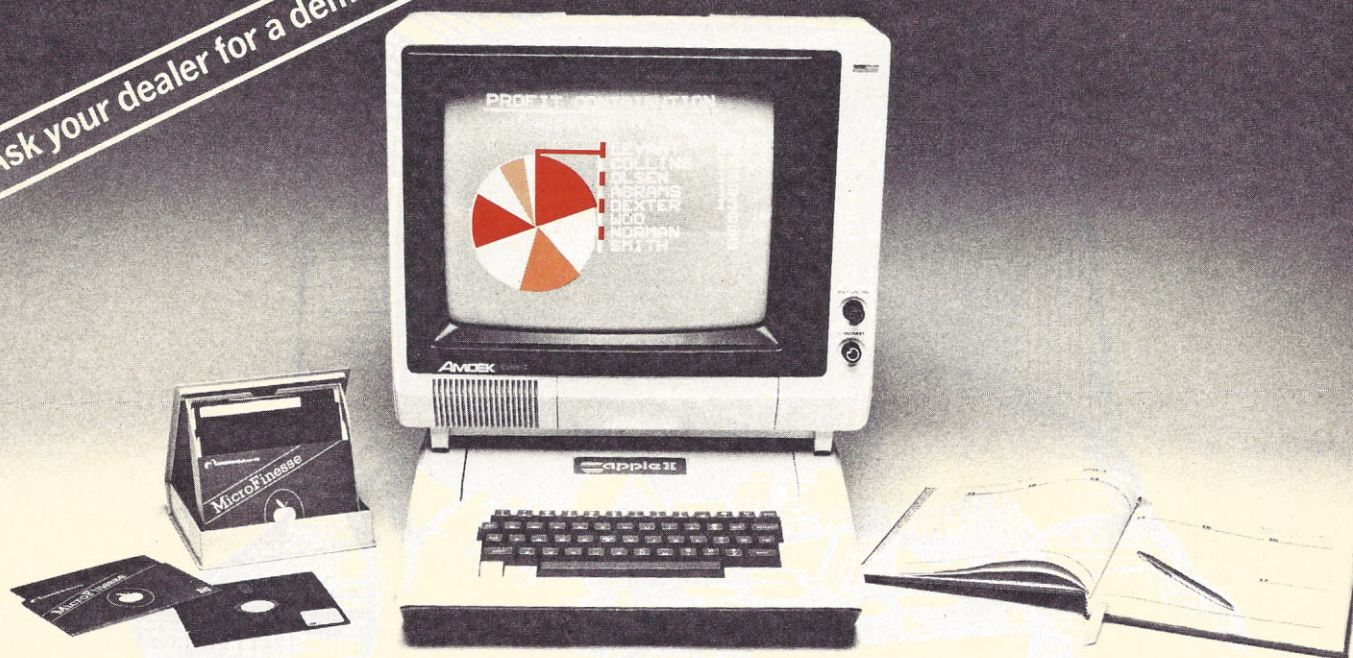


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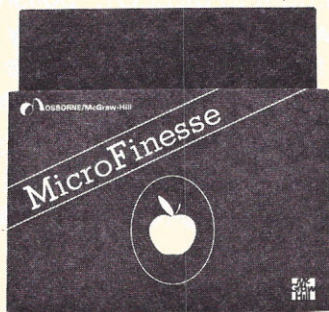
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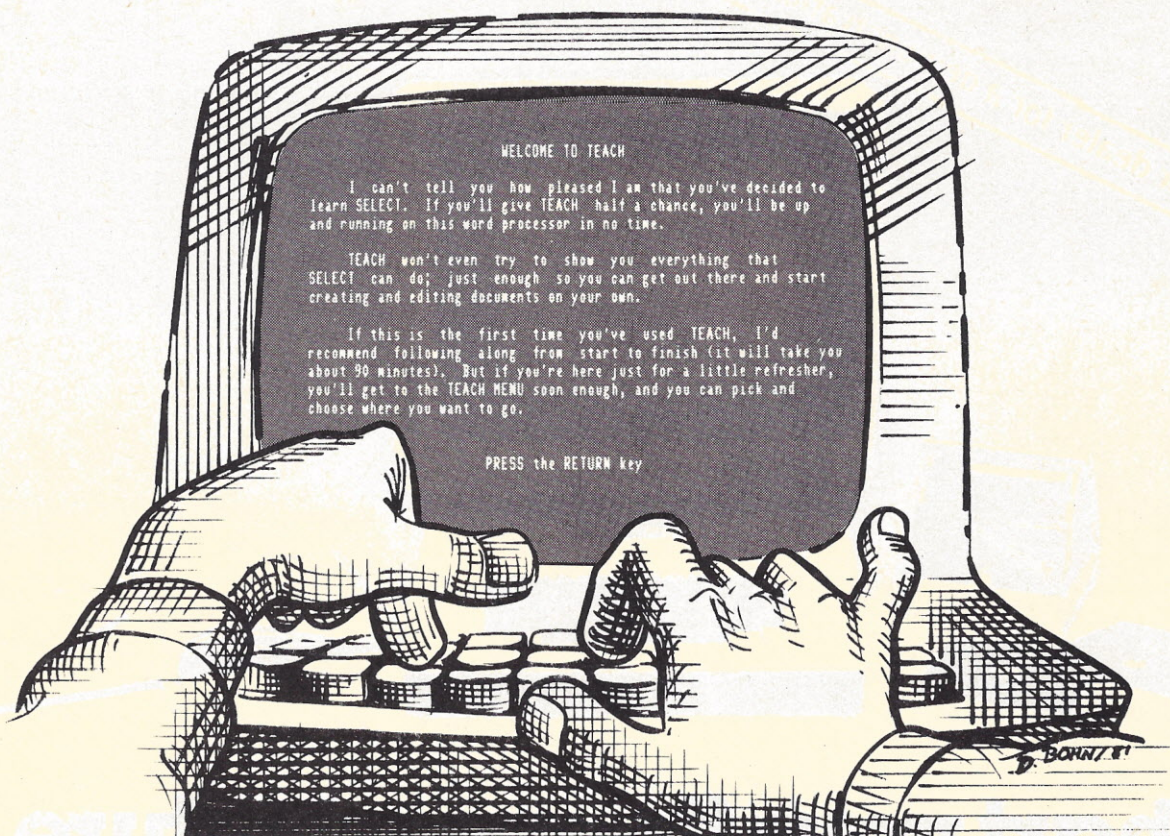
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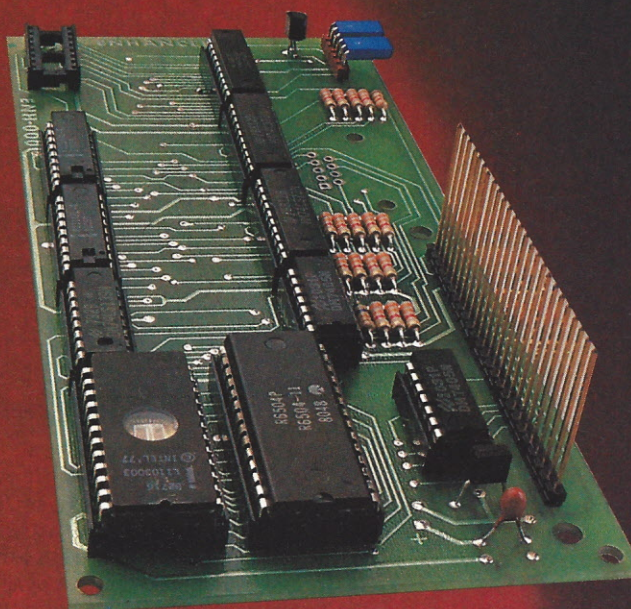
CIRCLE 84

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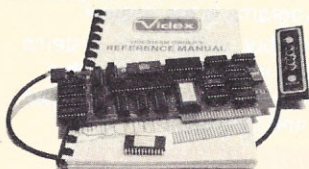
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Introducing the Enhancer II: a new Standard which is improving the relationship between Humans and Apples. The Enhancer II can help your Apple II's keyboard become more sociable by remembering words or phrases which can be entered into the Apple by the mere touch of a key. Life can become even easier because the Enhancer II can remember what you typed while your Apple was busy talking to your disc (or doing other things). Naturally, it knows the difference between upper and lower case letters and what shift keys are supposed to do. It even knows to auto repeat any key held down. The Enhancer II replaces the encoder board making installation simple.

Suggested retail price: \$149.00.



■ VIDEOTERM



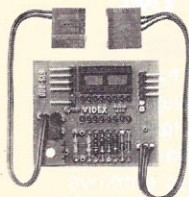
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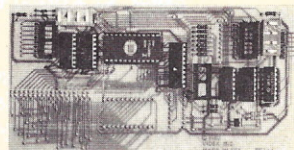
Suggested retail price \$345.00

■ SOFT VIDEO SWITCH

The Soft Video Switch is an automatic version of the popular Switch-plate. It knows whether it should display 40 or 80 columns or Apple graphics. It does the tedious work of switching video-out signals so you don't have to. The Soft Video Switch can be controlled by software. Any Videoterm with Firmware 2.0 or greater may be used with the Soft Video Switch. The single wire shift mod is also supported. Package price is \$35.00.



■ KEYBOARD AND DISPLAY ENHANCER



The original Keyboard and Display Enhancer is still available for Revision 0-6 Apples (on which the new Enhancer II will not fit). These Apples have memory select sockets at chip locations D1, E1 & F1. The Keyboard and Display Enhancer allows entry and display of upper & lower case letters with fully functional shift keys. It does NOT have user definable keys nor a type ahead buffer. The price is \$129.00.

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Videoterm Utilities Disc \$37.00 (includes)

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Version I is our proven low-cost package. It organizes information files and manipulates them. Very flexible report formats. Version I will satisfy most users for such jobs as client listings, inventories, real estate data, employee records, patient profiles, membership rosters, etc. The price is also very satisfying. **\$120.**

Great. — IFO Version II

Version II employs two drives. This means larger on-line file capacity faster access to information and more flexible reporting capabilities. It also incorporates the Soundex data retrieval capability. What's more, Version II supports the 80-column board, lower case and the Epson printer—to our knowledge, no one else does. Version II is indeed great. At a great price. **\$200.**

Super. — IFO Version III

Version III is designed for the CORVUS hard disk, hence offers far more capacity and far faster access than diskette-based systems. Version III also employs the Soundex system. Like Version II, it supports the 80-column board, lower case and the Epson printer, plus much more. The price is also super. **\$450.**

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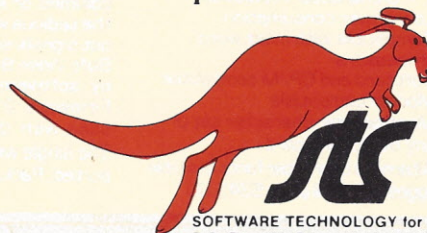
If your application calls for managing data, then one of our IFO family of DBMS programs is the answer.

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Visiterm	\$139
Visidex	\$229
Visiplot	\$185

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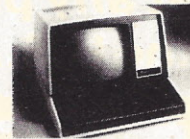
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CIRCLE 92

SOFTWARE UPDATE

BUSINESS

Managing Real Estate

The Real Estate Office Management (ROM) software package provides accounting and management information for real-estate brokerage firms. It is designed to handle one or more offices with one or more profit centers.

The system includes a general ledger that provides profit and loss statements, balance sheets, trial balances and transaction registers. The software allows the user to generate profit and loss statements for multiple profit centers, divisions and offices.

ROM allows for office or division budgeting with monthly, year-to-date and operating statement comparisons. Through the year-to-date budget, future cash-flow estimates can be projected.

The accounts-payable section of the software package includes a checkwriter, although manual checks may be used. A check is entered once and the system prints monthly checks until the check is removed. This allows for one-time input of ongoing items, such as mortgages and rent payments, and the checks are automatically processed monthly until removed from the system.

A list of vendors with year-to-date total payments is also maintained, and the system notifies the operator if cash requirements exceed available cash. This makes it difficult to overdraw the cash account.

The package operates on any CP/M, MP/M or CP/Net system. The price is \$350, which includes one year's maintenance.

For more information: REI, 221 North Lois, La Habra, CA 90631; (213) 947-2762.

CIRCLE 217

Planning and Modeling Tool

Multiplan is an interactive computer program that can be used as a tool for any kind of numeric planning or modeling. It has applications in financial analysis, home budgeting,

marketing evaluations, sales projections and record-keeping.

The software is used interactively, and presents menus, "next action" messages and a Help command. Computer skills are not required to use the program.

Multiplan provides a grid of cells, called a "worksheet," for holding the information the user supplies. After figures and formulas are entered, they can be modified or rearranged. Multiplan preserves the relationships on the worksheet, and recalculates totals and formulas on command or automatically as changes are made.

The package can be used with a variety of hardware systems. It has extra capability features such as multiple windows (as many as eight open at one time), easy entry of commands and data and cell formatting. Another feature is the program's ability to assign descriptive names to parts of a worksheet for use in formulas, commands and linking of worksheets via off-sheet references.

The price is \$275.

For more information: Microsoft, 10800 N.E. 8th St., Suite 819, Bellevue, WA 98004; (206) 828-8080.

CIRCLE 218

Application Packages

The Business Bookkeeping System, The Depreciation Planner and The Budget Planner are CP/M-based business application packages for the Apple III.

The Business Bookkeeping System functions both as a client accounting system for accountants and as a cash-basis accounting system for small businesses. It includes general ledger, vendor, customer and employee activity modules.

The Depreciation Planner is a complete asset-management system and includes the new ACRS tax regulations. It is designed for accountants and individual businesses.

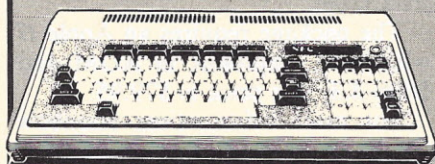
The Budget Planner is a modeling program for the analysis and development of budget and forecast plans. It evaluates the past 12 month's figures to project expenses and sales for the next 12 months.

The Business Bookkeeping system

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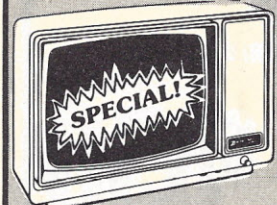


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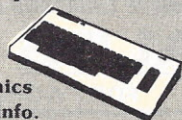
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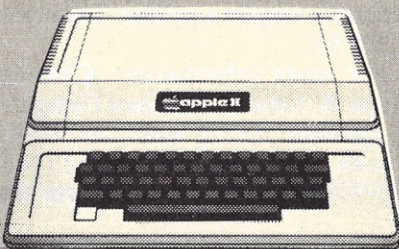
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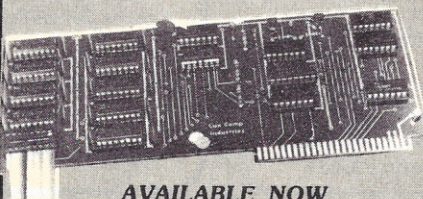
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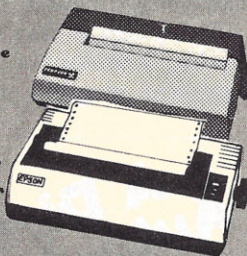
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SOFTWARE UPDATE

and The Depreciation Planner both cost \$395, and The Budget Planner costs \$150.

For more information: Dakin Corp., 7475 Dakin St., Fourth Floor, Denver, CO 80221; (303) 426-6090.

CIRCLE 219

Data-Base Management

The Reprogrammable Data Base Program allows the user with minimum programming knowledge to "reprogram" the system to meet his data needs. The program is provided in an open source-code format on standard Apple 3.3 DOS, and comes with working examples for a mailing-list program, a small-business inventory program and checking-account management system.

The system is easy to modify and flexible. It includes a data-base configuration program, a file-creation

and management element, a sorting utility, a report-formatting utility, a query-and-search element and a file-transfer utility. The system handles up to 9999 records of up to 255 characters each.

The program is used on an Apple II, and requires at least one disk drive. The print element and report generator require a printer. The price is \$99.95.

For more information: Charles Mann & Associates, Micro Computer Division, 55722 Santa Fe Trail, Yucca Valley, CA 92284; (714) 365-9718.

CIRCLE 220

Statistics Help

Daisy is a statistics package for the Apple II which offers statistical capabilities for business, scientific and social-science applications.

Features of the package include: user-assistance facilities, math and

time-series transforms, high-resolution plots, basic statistics (mean, standard deviation, etc.), correlations, multiple regression (six different procedures), model testing and evaluation, nonparametric statistics, hypothesis testing and analysis of variance.

Disk commands save, enter, examine and overlay variables. Data entry is through a "window" view into the data table.

The package requires an Apple II with 48k, Applesoft in ROM and DOS 3.3. The price is \$79.95.

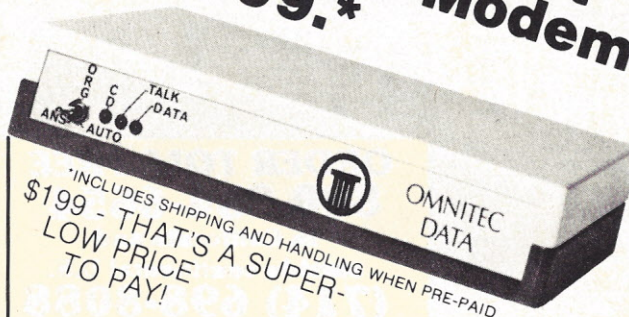
For more information: Rainbow Computing, 19517 Business Center Dr., Northridge, CA (213) 349-0300.

CIRCLE 221

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CIRCLE 113

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Angel is an interactive program with personalized greetings, prompts and error-checking. The program also functions as an executive appointment-scheduling system,

keeping track of all appointment dates, including recurring items such as quarterly reports and taxes.

The program runs on CP/M-compatible computers and uses 42k. The price is \$295.

For more information: Lifeboat Associates, 1651 Third Ave., New York, NY 10028; (212) 860-0300.

CIRCLE 222

Investment Analysis Tools

Beat-The-Market is a set of investment-analysis computer programs contained on individual cassettes. The programs run on handheld computers such as the Sharp PC 1211 Pocket Computer, the Radio Shack Pocket Computer and the Casio FX-702P Pocket Computer.

The packages consist of six individual cassettes and related documen-

tation. Three cassettes are dedicated to fundamental analysis techniques and three are devoted to technical analysis techniques.

The fundamental series is useful for the longer-term investor. The three cassettes in the series are: Fundamental Objectives and Industry Analyzer, which helps the investor review his portfolio and select investments that fit his objectives and time criteria; Fundamental Stock Analyzer, which aids in selecting individual growth stocks for purchase; and Fundamental Market Timing, which helps identify the best times for buying or selling stocks.

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CIRCLE 43

March 1982/Personal Computing 149

SOFTWARE UPDATE

crease the investors leverage by trading in puts and calls.

The complete set of Beat-The-Market costs \$120, and individual cassettes cost \$19.95 each including documentation.

For more information: PersaSoft of Oregon, 9069 S.W. Kelly, Portland, OR 97219; (503) 244-8239.

CIRCLE 223

Managing Portfolios

The Security Account Monitor is an investment tool for sophisticated investors. It allows quick reviews and studies of single or multiple securities portfolios on the Apple personal computer.

The package maintains and reports on any number of securities portfolios, and handles stocks, bonds, options, and other equity and fixed-income securities, in addition to

money-market funds and other cash equivalents.

Reports include valuation and unrealized long- and short-term gains and losses. Each report can be requested at summary, security type, individual security or security-lot levels and can be directed to the screen or printer.

The price is \$150.

For more information: Software Resources, 186 Alewife Brook Parkway, Suite 310, Cambridge, MA 02138; (617) 497-5900. **CIRCLE 224**

EDUCATIONAL

Elementary Math

K-8 Math with Student Management adds student management to the self-paced drills in addition, subtraction, multiplication and division.

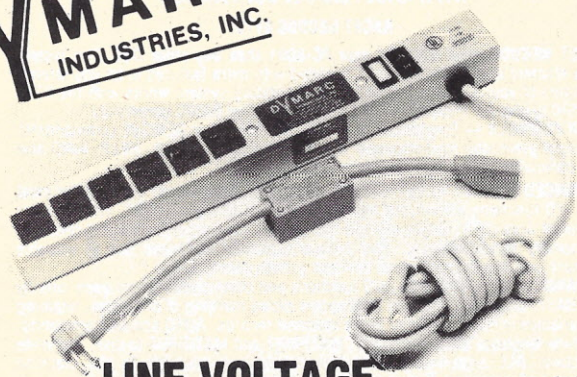
The K-8 Math Worksheet Generator prints worksheets and answer sheets for exercises selected from problem sequences.



In addition to student placement and drill and test modes, the program monitors promotions and demotions and permits teacher review of scores. A TRS-80 Model I or III with 32k and disk is required. A printer is optional.

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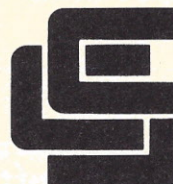
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SOFTWARE UPDATE

number and the problems to be included. A 32k TRS-80 Model I or III disk system is also required for this program, plus any TRS-80 line printer.

The K-8 Math with Student Management costs \$199 and the K-8 Math Student Worksheet costs \$89.95.

For more information: Radio Shack, 1800 One Tandy Center, Fort Worth, TX 76102. **CIRCLE 225**

Computerized Storybook

Space Waste Race is a computerized storybook for young children that includes animated graphics, music, sound effects and learning activities.

The program, in its 32k version, is a three-part education and entertain-

ment package. The Storybook section presents a graphically animated poem-story. The second section includes learning activities such as counting, numerical and alphabetical order and direction concepts. It also includes an automatic scoresheet to keep track of progress. The third section allows children to invent their own games with moving moons.

Space Waste Race is available on cassette or disk for the TRS-80 Models I and III. The 32k disk version costs \$29.95 and the 16k tape version costs \$19.95.

For more information: Storybooks of the Future, 527 41st Ave., San Francisco, CA 94121; (415) 386-5184. **CIRCLE 226**

Spelling Check

Hexspell 2 spelling checker checks dictionary words as well as the com-

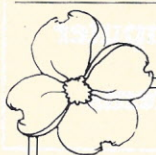
plete text. The program will also learn and check the codes, formulae and numbers common in many commercial and technical documents.

The user can define which characters make up a "word," and a single keystroke teaches Hexspell new "words" as it checks the text. The program orders its wordlist by frequency of use, adapting itself to the user's vocabulary.

Hexspell 2 comes with an initial 25,000 word list, which can be expanded to 50,000 words or codes. It features one-step error detection and correction. Erroneous words are highlighted in full context when detected, and can be replaced immediately. The replacement word is also rechecked to ensure correctness.

The program requires a 48k TRS-80 Model I or III with two disk drives, and costs \$99.

For more information: Hexagon



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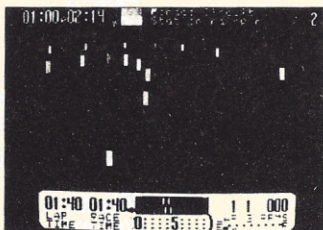
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Cranston Manor	34.95	29.95	Robot War	39.95	34.95	Subscribe II™	129.95	110.50
Ulysses And The Golden Fleece	34.95	29.95	Falcons	29.95	25.95	Basic Compiler (Microsoft)	395.00	315.00
Time Zone	99.95	86.95	International Grand Prix	30.00	26.00	Magic Wand™ (C)	350.00	299.00
Sabotage	24.95	21.95	Space Eggs	29.95	25.95	Microproof™ (C)	149.50	128.00
Softporn Adventure	29.95	25.50	Dark Forest	29.95	25.95	Target™	195.00	156.00
Threshold	39.95	29.95	Tigers In The Snow	39.95	34.95	Pascal Programmer™	125.00	99.00
Crossfire	29.95	25.50	Computer Ambush	59.95	49.95	Applesoft Compiler 3.3	175.00	150.00
Hires Golf	29.95	25.50	Napoleons Command	59.95	47.95	Creative Financing™	150.00	125.00
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Sneakers	29.95	25.50	Trickshot	39.95	29.95	Desktop Plan III™	300.00	250.00
Gorgon	39.95	33.95	Firebird	29.95	25.95	DB Master™ Utility Pak#1	99.00	85.00
Beer Run	34.95	29.95	BUSINESS			Super-Text II™	150.00	100.00
Wizardry	49.95	39.95	Property Management System™	325.00	245.00	EDUCATION		
Castle Wolfenstein	29.95	26.95	PFST™	95.00	81.00	Fractions	39.95	35.95
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Adventure 1, 2, 3	\$39.95	\$26.95	Sorcerer Of Siva (T)	\$29.95	\$26.95	+ Fortran 80™	\$100.00	\$79.95
Adventure 4, 5, 6	39.95	26.95	Battle Of Shiloh (T)	24.95	21.95	Editor/Assembler Plus™ (T)	29.95	25.95
Lunar Lander	20.95	17.95	Tigers In The Snow (T)	24.95	21.95	EDUCATION		
Lunar Lander (T)	14.95	12.95	Curse Of Crowley Manor	19.95	17.95	History And Geography (T)	\$24.95	20.95
+ Starfighter	29.95	24.95	+ Basketball Handicapper	99.00	67.00	Junior High Math (T)	24.95	20.95
Starfighter (T)	24.95	21.95	Meteor Mission	19.95	17.95	+ French I	19.95	17.95
+ Master Reversi	29.95	25.95	BUSINESS			+ German I	19.95	17.95
Space Shuttle (T)	14.95	12.95	Maxi-Manager	99.95	67.00	Math Pak I (T)	14.95	13.00
Jet Fighter Pilot (T)	14.95	12.95	+ Basic Compiler	195.00	165.00	Typing Tutor (T)	19.95	16.95
+ Olympic Decathlon (T/D)	29.95	25.95	Electronic Breadboard	49.95	33.50	+ Spanish I	19.95	17.95
+ Interlude	21.95	18.95	+ Superscript™	50.00	40.00	Key: Assume Both Mod I And Mod III Disk Unless Specified.		
Crush, Crumble And Chomp (T)	29.95	26.95	+ Investment Analysis (T)	49.95	42.95	+ Mod I Only		
			+ Easy Calc™	49.95	44.95			

ATARI SOFTWARE OF THE MONTH FEATURE PRODUCTS FOR MARCH

ENTERTAINMENT	RETAIL	MEMBER PRICE	ENTERTAINMENT (cont'd)	RETAIL	MEMBER PRICE	EDUCATION	RETAIL	MEMBER PRICE
Adventure 1, 2, 3	\$39.95	\$26.95	Jawbreaker	\$29.95	\$25.95	US Government	\$29.95	\$26.95
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Star Raiders™ (K)	39.95	34.95	Bond Analysis	24.95	21.95	Basic Electricity (T)	29.95	25.95
Crush, Crumble And Chomp	39.95	35.95	Stock Analysis	24.95	21.95			

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Wordstar™	\$399.95	\$330.00	Basic Compiler (Microsoft)	\$395.00	\$315.00	Peachtree™ Sales Invoicing	\$600.00	\$499.00
Dastar™	295.00	235.00	FMS-80™	995.00	795.00	Peachtree™ Accounts Payable	600.00	499.00
Calcstar™	295.00	235.00	DB Master™	229.00	190.00	Peachtree™ Payroll	600.00	499.00
D Base II™	695.00	555.00	Peachtree™ General Ledger	600.00	499.00	Peachtree™ Inventory	600.00	499.00
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SOFTWARE UPDATE

Systems, P.O. Box 397, Stn. A, Vancouver, B.C., Canada V6C 2N2; (604) 682-7646. **CIRCLE 227**

College Board Preparation

Each program in the College Board SAT Preparation Series confronts the user with a series of questions. Each program is based upon an analysis of past SAT exams and presents material of the same level of difficulty and in the same form used in the College Board examinations.

Answers to all questions and detailed explanations of all math questions are given. Scoring is provided in accordance with the formula actually used by the College Boards.

The SAT Preparation Series includes 25 16k programs that offer comprehensive coverage of vocabulary, reading comprehension, sentence completion, word relation-

ships, algebra, geometry and arithmetic. The math problems include both problem solving and quantity comparison.

The series is available on disk or cassette for the Apple, TRS-80, Commodore PET, Ohio Scientific, North Star, PDP-11, Heath/Zenith and Atari computers for \$220.95.

For more information: Krell Software, 21 Millbrook Dr., Stony Brook, NY 11790; (516) 751-5139.

CIRCLE 228

Practicing Capitalization

Capitalization is a two-disk system that provides practice and testing on the application of the major rules of capitalization.

The practice disk presents a rule followed by up to 20 randomly presented sentences which give the student practice on that rule. The test

disk measures the student's ability to correctly apply capitalization rules and may be used as a pre- or post-test.

The management system gives the student immediate feedback and stores records of each student's test results for review by the teacher. Results may be printed or viewed on the screen. The teacher can also modify or add new materials to either disk.

The package requires a 48k Apple II with Applesoft and one disk drive. It costs \$49.95.

For more information: Hartley Courseware, Box 432, Dept. E, Dimondale, MI 48821; (616) 942-8987.

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	TI787 Portable KSR, 120 CPS	2,845	273	152	102		
	TI810 RO Printer	1,695	162	90	61		
	TI820 KSR Printer	2,195	211	117	80		
	ADM3A CRT Terminal	595	57	34	22		
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	2120 KSR Printer 120 CPS	2,195	211	117	80		
HAZELTINE	Executive 80/20	1,345	127	75	49		
	Executive 80/30	1,695	162	90	61		
EPSON	MX-80 F/T Printer	745	71	42	27		
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CIRCLE 86

CIRCLE 99

minals using the machine-language program Commwhiz. The computers can then communicate with the Source, CompuServe, other mainframes and a variety of bulletin-board systems. The program provides a full array of features needed for uploading and downloading, disk loading and saving text prepared with Scripsit or Electric Pencil, BASIC programs or machine-language source-code files.

In the terminal mode, Commwhiz continuously displays a status line above a protect line at the top of the screen, showing the mode of operation and the status of the buffer, the printer, the upper- and lowercase choice and the communications parameters in effect. The user can execute commands or can reset communications parameters by selecting from screen displayed menus. After the menu selection is made, any text that was on the screen in terminal mode is restored.

Other features of Commwhiz include user-defined messages for sign-in and log-on, the ability to send special characters and control characters, the ability to execute DOS commands while in the terminal program, an option for auto-open and close of the text buffer (over 14k in a 32k system and over 30k in a 48k system), memory use and status, and the ability to view the buffer contents by page or by line.

The program costs about \$80.

For more information: VolksMicro Computer Systems, 202 Packets Court, Suite C, Williamsburg, VA 23185; (804) 220-0005. **CIRCLE 230**

An Electronic Mailman

Move-It is a communications program that allows the transfer of programs and data files between any two computers running CP/M, CP/M 86, MP/M or MP/M 86. A program is also provided to configure Move-It for most other personal computers, even those with incompatible disk formats.

Move-It can be used as an "electronic mailman" sending letters or correspondence between various

company offices over standard phone lines. Branch offices, salemen in the field or warehouses can send up-to-the-minute information to the corporate headquarters. In addition, the program supports interoffice communication.

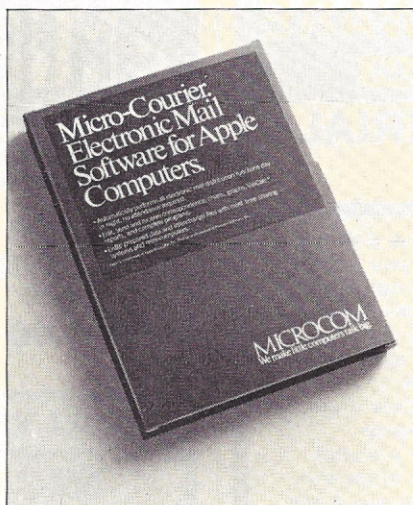
One feature of the program is its ability to display both local and remote directories, as well as to send or retrieve files from a remote computer without remote operator assistance.

Move-It is available for \$99.95 plus \$2 shipping and handling.

For more information: Woolf Software Systems, 23842 Archwood St., Canoga Park, CA 91307; (213) 703-8112. **CIRCLE 231**

Electronic Mail

Micro-Courier allows Apple II owners to rapidly transmit charts, graphs, correspondence, VisiCalc reports and entire programs to other Apple computers over standard phone lines.



Transmissions are sent automatically, allowing the owner to take advantage of low-cost, late-night phone rates. Using these rates, the Micro-Courier sends 1000 words of text in one minute for less than 25 cents.

Micro-Courier expands the scope of the Apple computer by linking it with larger computers and information time-sharing systems. The price is \$250.

For more information: Microcom,

89 State St., Boston, MA 02109; (617) 367-6362. **CIRCLE 232**

Transferring Files

Lync 2.0 transfers files between two personal computers. The program features a full error-detection protocol which insures that the transferred data are complete and correct. When errors are detected, re-transmissions are made until the data are successfully transferred.

The program transfers files individually or in groups. Groups of files can be specified using manually entered lists of files, wildcard specifications, or can be indirectly specified with a file containing a list of files to be transferred.

Lync 2.0 has self-generating I/O routines that prompt the user for information about his serial interface. Using this information, the program constructs the I/O drivers to suit the interface. The program transfers files at up to 9600 baud and is not limited by the speed of the computer's terminal.

The price is \$95.

For more information: Pickles & Trout, P.O. Box 1206, Goleta, CA 93116; (805) 685-4641. **CIRCLE 233**

UTILITY

Translating CP/M

Supervyz is a package of five software programs that work together to provide an easy-to-follow, step-by-step sequence of menus. These menus lead users through even the most complex programs, from word processing and accounting to data verification and backup.

User responses are translated into a form that CP/M recognizes. The program's error messages and computer-assisted tutoring help users understand their CP/M programs, avoid mistakes and correct previously made errors.

One of the package's programs configures Supervyz to work with popular terminals and video boards. Files are provided to handle the stan-

SOFTWARE UPDATE

dard functions of file backup and disk maintenance. Also included are sample menus for the most popular word processing and business software, although users are free to create custom menus.

The package runs on any CP/M computer having a minimum of 32k RAM. The price is \$95.

For more information: Epic Computer Corp., 7542 Trade St., San Diego, CA 92121; (714) 695-3560.

CIRCLE 234

Looking Inside

The PET/CBM Cross Reference Program shows program structure by displaying line numbers that are "GOTOed" or "GOSUBed" from other lines in the program. Line numbers in which different variables appear are also listed.

The user simply enters the pro-

gram name, the desired listing format (multistatement lines on separate lines, or all on one line), and the presence of special software commands. The program provides a formatted program listing, followed by a line-number cross reference, a variable cross reference and program optimization statistics.

The line-number cross reference handles GOTO, GOSUB, ONGOTO and ONGOSUB, and flags any unresolved branches. The variable cross reference displays both scalar and dimensioned variables, as well as user-defined functions that are sorted into alphanumeric order. The statistics display the amount of code in the program, the amount of RAM used by unneeded spaces, long variables and REMarks.

The program runs on any 32k PET or CBM with 4040 or 8050 disks, and any printer. The price is \$29.95.

For more information: Oppenheimer Software, 79 St. Boat Basin #39, New York, NY 10024; (212) 787-2416.

CIRCLE 235

Compacting Memory

Compactors I and IV are the first in a series of memory-management products for the TRS-80 Microcomputer Model III. The Compactor I allows the TRS-80 to serve as an 80 x 24 video display and provides an RS-232-C serial interface.

Compactor I allows the user to immediately employ recognized CP/M software and become familiar with the CP/M Operating System. It enhances but does not change the computer's operating environment.

Compactor IV allows the TRS-80 to be used as either a stand-alone computer or as an intelligent termi-

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SOFTWARE UPDATE

nal to larger host computer systems.

Compactor I costs \$450 and Compactor IV costs \$475.

For more information: Hurricane Laboratories, P.O. Box 631, Cupertino, CA 95015; (408) 446-0777.

CIRCLE 236

Composing Graphics

With Graphics Composer, an Atari 400/800 personal computer and paddles or a joystick, a picture outline can be drawn on the computer's hi-resolution screen. The graphic design can then be completed using color fill-in, color brushes or by adding text.

The program allows creation of player/missile shapes which may be used in other programs. The Geometric Figures program lets the user

define circles, triangles, polygons, parallelograms and trigonometric curves.

Graphics Composer is available on cassette or disk for \$39.95 and requires 32k RAM.

For more information: Versa Computing, 3541 Old Conejo Rd., Suite 104, Newbury Park, CA 91320; (805) 498-1956.

CIRCLE 237

Documentation Tool

BPSXREF is a listing and cross-reference generator for Microsoft's BASIC-80 5.x language. It will produce a formatted program listing, an alphabetized list of program variables and functions cross-referenced to the line numbers where they are used.

The formatted listing allows for page titles, page numbers and skipped lines for added clarity in program documentation. A variety of options allow the user to decide whether he wants a simple listing, a detailed cross-reference or some combination of listing and cross-reference.

The program operates on ASCII-formatted CP/M files as produced by MBASIC's SAVE command with the "A" option or text editors, such as ED, WORDMASTER and MINCE.

The program requires a 48k CP/M-compatible operating system and is available for \$124.

For more information: BPS, 82 Woods End Rd., Fairfield, CT 06430; (203) 254-1659.

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CIRCLE 104

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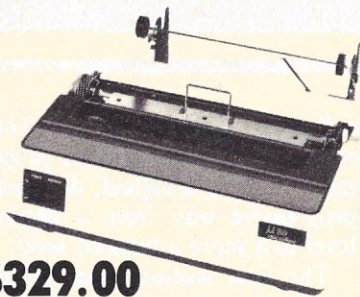
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CIRCLE 105

MARCH SPECIALS

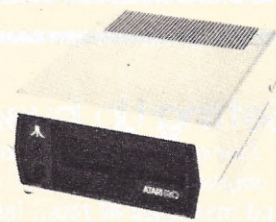
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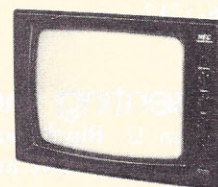
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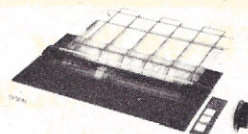
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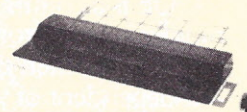
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The book also helps with preparing financial reports; composing, editing and typing letters; posting sales; and performing calculations.

The price is \$12.95.

For more information: dilithium Press, 11000 S.W. 11th St., Suite E, Beaverton, OR 97005; (503) 646-2713.

CIRCLE 239

Presenting the Rules

Brian D. Blackwood and George H. Blackwood have authored a book

called *Applesoft Language*. The lessons in the book present programming rules in a logical, detailed and progressive way from a beginner's level to a more advanced level.

The first section takes a look at Applesoft and introduces the user to detailed programming routines. The section also covers print rules, variables, loops to functions, reserved words and program outlines.

The second section, programming, deals with approaching the problem, program flexibility, formulas and double-subscription arrays. The skills needed to read and design flowcharts are also provided.

Simulations, games and graphics are featured in the third section. To make learning easier for the beginner, lessons provide reference points. If the user has trouble with programming error, he can return to the

last reference point to attempt to understand the correct procedure.

The price of the book is \$10.95.

For more information: Howard W. Sams & Co., 4300 W. 62nd St., P.O. Box 7092, Indianapolis, IN 46206; (317) 298-5400.

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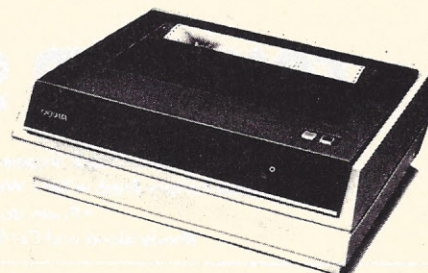
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Programming The Apple, a 550-page volume, contains examples, figures and tables to lead the reader through a logical understanding of how to program the Apple personal computer.

The book is written by John Campbell and Lance Zimmerman. It contains 12 chapters, a glossary including over 100 definitions, a bibliography with over 60 references, 6500 lines of code and 330 figures, examples, illustrations and tables.

The price is \$24.95.

For more information: Mesa Research, Rt. 1, Box 1456A, Waco, TX 76710; (817) 848-5272.

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LITERATURE

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For more information: Radio Shack, 1800 One Tandy Center, Fort Worth, TX 76102.

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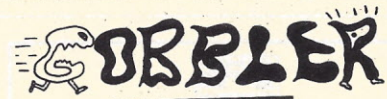
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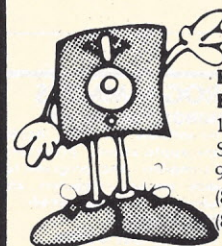
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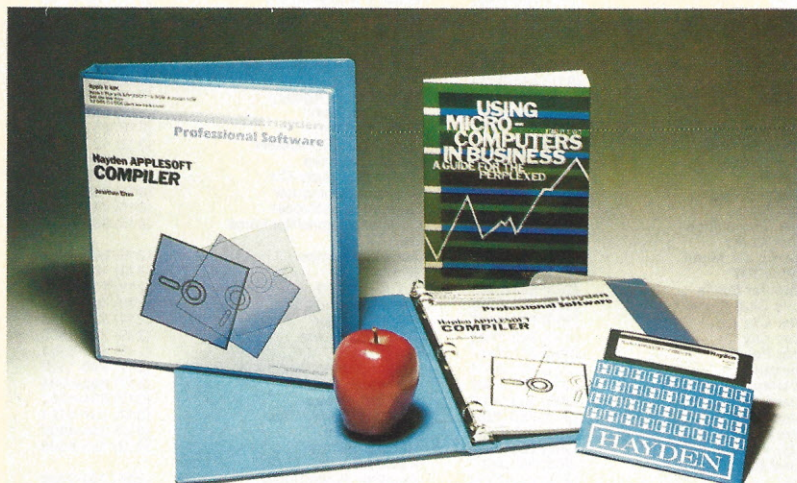
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Computer Post (415) 790-0410
Computer Store/San Leandro (415) 569-4174
Heathkit Electrs. (415) 236-8870
Keplers' Books (415) 948-5666
Marin Computer Center (415) 472-2650
Micro Age Computer Store (415) 786-5264
Micro Age Computer Store (415) 964-7063
P C Computers (415) 527-6657
Printers (415) 327-6500
Stacey's Bookstore (415) 421-4687
Stacey's Bookstore (415) 326-0681
Sunset Computers (415) 665-7378
Systems Formulate (415) 281-2621
Technika Berkeley (415) 524-8934
3 E Software Systems (415) 537-3637
Computer Scene (707) 462-1578
Santa Rosa Computer Ctr. (707) 528-6480
Zackit Vallejo (707) 644-6676
Advanced Computer Prods. (714) 558-8813
Apple of Orange (714) 974-3082
Byte Shop (714) 565-8008
Byte Shop/Placentia (714) 524-5380
Computer Age (714) 565-4042
Computer City (714) 549-7749
Computerland (714) 464-5656
Computerland (714) 560-9912
Computerland/San Bernardino (714) 886-6838
Computerland/W. Los Angeles (714) 560-9912
Computerland/CA (714) 598-7505
Computer Merchant (714) 583-3963
Computer Merchant (714) 583-3963
Computer Metrics (714) 579-8066
Computer Post (714) 695-2000
Computer Station (714) 661-8062

Computer Store Chula Vista (714) 281-0285
Computer World (714) 891-2584
Consumer Computers (714) 465-8888
CTC-The Computer People (714) 565-0505
Dimensional Software (714) 275-4243
Heathkit Electro Center (714) 776-9420
James Games Computer Center (714) 985-3278
Integrated Circuits Unltd (714) 278-4393
Marvac Electrs. (714) 540-3280
Net Profit Computers (714) 750-7318
Pomona Valley News Agency (714) 591-3885
Byte Shop (805) 647-8945
Computerland (805) 928-1919
Computer Plaza (805) 687-9391
Computer Plus (805) 963-4542
Computer Shop (805) 963-1325
Computer Solutions (805) 922-6639
Computer Sound (805) 945-5921
Computers To-Go (805) 496-2868
Dow Radio (805) 486-6353
Opsbi Personal Electr. (805) 967-7100
Byte Shop/Sacramento (916) 961-2983
Capitol Computer (916) 483-4729
Computerland/Sacramento (916) 920-8981
Zackit Electrs. (916) 446-3131

COLORADO
Aparat (303) 741-1778
Colorado Computer Sys. (303) 426-5880
Computer Connection (303) 449-8282
Computer Connection (303) 449-8282
Computerland (303) 574-4170
Computerland/Denver (303) 759-4685
Computer Shack (303) 564-3545
Computer Technology (303) 427-4438
Computer Works (303) 449-6233
Micro Computer Mgmt. (303) 493-5700

CONNECTICUT
AM Computer Prods. (203) 621-2331
Aetna Life Club Store (203) 273-3058
Computer City (203) 521-2245
Computer City (203) 562-7546
Computer Ease (203) 877-7447
Computerland (203) 235-9204
Computerland/New Haven (203) 273-4807
Computer Store (203) 563-9000
Computer Store (203) 356-1920
Computer Store (203) 627-0188
Computer Works (203) 255-9096
Diversified Electrs. (203) 397-2607
Exel Sys. (203) 348-5894
Harold's Drugs (203) 583-1854
Logical Systems (203) 677-4557
Micro Age Computer Ctr. (203) 846-0851
Technology Sys. (203) 748-6856

DELAWARE
Computerland/New Castle (302) 738-9656
Computer Store (302) 478-7772
Micro Age Computer Store (302) 998-7340
Micro Products (302) 762-0227
Computerland (304) 624-6409

DISTRICT OF COLUMBIA
Computer Store (202) 272-0294
Pentagon Book Stores (202) 695-0870
Program Store (202) 337-4693
Students Book Co. (202) 223-3327

FLORIDA
A I Personal Computer (305) 339-8914
Byte Shop of Miami (305) 264-2983
Clarks Out of Town News (305) 467-1543
Computer Ctr./Palm Beaches (305) 689-3233
Computerland (305) 862-6202
Computerland/Boca Raton (305) 368-1122
Computerland/Ft. Lauderdale (305) 566-0776
Computerland/W. Palm Beach (305) 684-3338
Computer Scene (305) 945-1014
Electronic Equipment Co. (305) 871-3500
H.I.S. Computeration (305) 254-9399
Lighthouse Book Store (305) 781-1945
West Indies Electr. (305) 556-1300
Computerland (813) 971-1680
Extra Extra Newstand (813) 886-1802
Henry's News Stand (813) 536-3863
Micro Computer System Inc. (813) 879-4301
Poling Place (813) 541-2729
Computerland (904) 224-9341
Computerland (904) 731-2471
Computer Shack (904) 396-1800
Computer Store/Gulf Breeze (904) 932-0660
Computer Sys. Resource (904) 376-4276
Florida Book Store (904) 376-6066
Goerings Book Ctr. (904) 378-0363
Grice Electrs. Inc. (904) 477-8100
Williams Radio and TV (904) 354-5460

GEORGIA
Atlanta Computer Mart (404) 455-0647
Baileys Computer Shop (404) 790-5771
Computerland/Atlanta (404) 953-0406
Guild News Agency (404) 252-4166
Electronics 21 Inc. (912) 352-0585

HAWAII
Amtec Inc. (808) 955-7429
Computer Center (808) 448-2171
Computerland/Hawaii (808) 521-8002
Data 1 Microcomputer (808) 946-1733
Radio Shack No. 7086 (808) 487-1509
Univ. of Hawaii Bookstore (808) 948-8022

IOWA
Memory Bank (319) 386-3330
Business Data Processing (515) 276-8858

IDAHO
Computer Co. Inc. (208) 375-9381
Northwest Computer Ctr. (208) 375-6681

ILLINOIS
Byte Shop (217) 352-2323
Computerland/Champaign (217) 359-0895
Computer-Ease (309) 833-3886
Wallace Micro-Mart Inc. (309) 685-7876
ABC Byte Shop (312) 673-3550
Book Market (312) 944-3358
Book Market (312) 440-4475
Byte Shop (312) 579-0920
Chicago Main Newstand (312) 864-2727
Complete Computing (312) 620-0808
Compushop (312) 593-1800
Computerland (312) 949-1300
Computerland (312) 967-1714
Computerland/Northbrook (312) 272-4703
Computerland/Schaumburg (312) 253-3009
Data Domain/Schaumburg (312) 397-8700
Digitalworld (312) 628-9222
Erickson Communication (312) 631-5181
Kroch's & Brentano's (312) 332-7500
Micro Computer Ctr./Geneva (312) 232-1545
Nabih's Inc. (312) 869-6140
Northbrook Computers (312) 480-9190
Oak Brook Computer Ctr. (312) 941-9005
Page One (312) 529-9060
Prairie News Agency (312) 883-1141
The Book Store (312) 255-8040
Videomart Inc. (312) 861-1255
Wine Micro Computers (312) 420-8813
Univ. Bookstore (618) 536-3221
Alpine Computer Ctr. (618) 229-0200
Appletree Computer (618) 758-8666
Computerland/Joliet (618) 741-3303
Computer Store/Rockford (618) 962-7580

INDIANA
Acro Electronics (219) 397-8681
Bytex (219) 485-7511
Computerland (219) 256-5688
Computerland (219) 483-8107
Computer Plus (219) 865-3930
Computer Room (219) 277-1515
Data Base (219) 484-3164
Computerland/Anderson (317) 649-1122
Computer Store (317) 862-9994
Graham Electrs. (317) 634-8202
Heathkit Electr. Ctrs. (317) 257-4321
Data Domain (612) 334-3607
Hoosier Electrs. (612) 232-8508

KANSAS
Amateur Radio Equip. (316) 264-9166
Computerland Hutchinson (316) 662-6832
Computerland (316) 684-3870
High Technology/Wichita (316) 262-0315
Book Nook (913) no listing
Computerland (913) 492-8882
Computerland/Topeka (913) 287-6530
Micro Age Computer Store (913) 823-7596
Online Computer Centers (913) 341-6651
Personal Computer Ctr. (913) 649-5942

KENTUCKY
Computer Emporium (502) 589-9482
Heathkit Electr. (502) 245-7811
Computer Place (606) 276-3594

LOUISIANA
Computer Shoppe Inc. (504) 454-6600

MAINE
Home Port Computers (207) 873-2192
Retail Computer Ctr. (207) 669-6736

MARYLAND
Bethesda Computers (301) 667-1992
Chaffitz (301) 340-3300
Computer Crossroads (301) 730-5513
Computers Etc. (301) 288-5801
Computers Etc. (301) 288-5801
Computers Etc. (301) 296-0520
Computerland (301) 340-8484
Computerland/Towson (301) 337-5555
Computer Unlimited (301) 321-1553
Heathkit Electrs. (301) 881-5420
Komar Ltd. (301) 675-2200
Logical Choice (301) 465-3175
Micro Age (301) 762-7585
Muse Computer Ctr. (301) 659-7212
Personalized Computer Consul. (301) 840-0412
Program Store/Baltimore (301) 944-0200
Radio Shack (301) 224-2900
The Comm. Center (301) 792-0600

MASSACHUSETTS
Computer Source (413) 443-7181
Retail Computer Ctr. (413) 589-0106
Small Computer Data Sys. (413) 592-6600
Computer City (617) 755-5464
Computer City (617) 875-8126
Computer City (617) 273-3146
Computer City (617) 242-3350
Computer City (617) 826-9217
Computer City (617) 774-7118
Computerland/Boston (617) 235-6652
Computerland/Boston (617) 482-6033
Computer Store (617) 232-5470
Computer Store (617) 354-4599
Harvest Computer (617) 547-3289
Heathkit (617) 531-9332
Heathkit Electrs. (617) 237-1510
Heathkit Electrs. (617) 531-9330
Land of Electronics (617) 581-3133
Out of Town News (617) 354-7777
Palace Spa (617) 783-5858
Retail Computer Ctr. (617) 935-8060
Small Business Group (617) 692-3800
Video Station (617) 933-1445
YDI Electrs. (617) 449-1005

MICHIGAN

Community News Center
Computer Center
Computer Connection
Computer Horizons
Computerland
Computerland/Southfield
Computer Mart
Computer Mart/Flint
Front Page Bookstore
Heathkit Electr.
Heathkit Electr. Ctr.
Level 4 Products
New Horizons Book Shop
Rainbow Computers
Rochester Book Center
Simtec
Spectrum Computers
Community News
Community Newscenter
Community Newscenter
Computer Mart/Lansing
Computerland/Grand Rapids
Micro Computer World
NCE/Compumart

(313) 662-6150
(313) 422-2570
(313) 447-4470
(313) 464-6502
(313) 772-6540
(313) 356-8111
(313) 288-0040
(313) 234-0161
(313) 332-3431
(313) 772-0416
(313) 535-6480
(313) 525-6200
(313) 296-1560
(313) 528-3535
(313) 651-0199
(313) 855-3990
(313) 559-5252
(517) 321-8797
(517) 694-0490
(517) 349-3510
(517) 351-1777
(616) 942-9231
(616) 451-8348
(617) 491-2700

MINNESOTA

Compudata
Granada News
Readmore Book & Card
ABS Computer
Computer Depot
Computerland
Digital Den
Heathkit Ctr.
Micro Age Computer Store
Minnesota Book Center
Readmore Bookstore
Schindler's Hennepin News
Shinder Book & News

(218) 722-6319
(218) 727-9122
(507) 345-5704
(612) 253-8734
(612) 375-2008
(612) 559-1984
(612) 699-8442
(612) 938-6371
(612) 338-1777
(612) 373-5734
(612) 333-3628
(612) 333-6942
(612) 227-0899

MISSOURI

Computer Country-North
Gateway Electrs
Micro-Age Computer Ctr.
Computer Mart/Springfield
House of Computers
Southeastern Audd. Vis.

(314) 921-5644
(314) 427-6116
(314) 567-7844
(417) 862-8500
(417) 782-0880
(601) 324-0797

MONTANA

Prairie Computers

(406) 727-6992

NEBRASKA

Abacus
Computerland/Lincoln
Computerland/Omaha
Electronic Center
Micro Age Computer Store

(402) 345-6020
(402) 391-6716
(402) 391-6716
(402) 476-7331
(402) 564-7213

NEVADA

Century 23
Computer Store
Home Computers
PCS Computer Service

(702) 870-1534
(702) 826-5055
(702) 736-6363
(702) 870-4138

NEW HAMPSHIRE

Blitznoyes
Chips Microcenter
Computer City
Computer City
Computerland/Nashua
Computer Mart/New Hampshire
Computer Town

(603) 224-8233
(603) 643-5413
(603) 898-2390
(603) 668-9527
(603) 889-5238
(603) 883-2386
(603) 893-8812

NEW JERSEY

Apple Coor
Computerability
Computer Corner/New Jersey
Computer Dimensions
Computer Forum
Computerland
Computerland/Morristown
Computermart/New Jersey
Computer Nook
Computer Universe
Comtek
Earth Rise Micro Sys.
Heathkit Electr. Ctr.
Radio Shack
Software Asylum
Software City
Stoneledge Computer
Clancy Paul
Computer Encounter
Computerland/Cherry Hill
Computer Workshop
Personal Computing
Radio Shack

(201) 766-3977
(201) 643-5413
(201) 835-7080
(201) 232-8300
(201) 530-9103
(201) 845-9303
(201) 539-4077
(201) 283-0600
(201) 575-9468
(201) 262-0960
(201) 472-2440
(201) 822-0518
(201) 791-6935
(201) 244-7494
(201) 969-0637
(201) 342-8788
(201) 277-1020
(609) 683-0060
(609) 924-8757
(609) 795-5900
(609) 429-5703
(609) 927-3880
(609) 234-2666

NEW MEXICO

Computer Shop
Electronic Parts Co.
Micro Waves Computer Store
Computer Tech Assoc.

(505) 762-3327
(505) 293-6161
(505) 883-0955
(915) 533-2108

NEW YORK

Computer Center
Computer Era
Computerland
Computerland
Comtek/Brooklyn
Comtek/Staten Island
Dafel Sys.
Harcourt Brace Bookstore
Magazine Emporium
Majority New Dist.
Papyrus Books
Super Business Machines
Computers Etc.
Computerland/Massina
Berliner Computer Ctr.

(212) 889-8130
(212) 860-0500
(212) 840-3223
(212) 832-2180
(212) 332-5933
(212) 698-7050
(212) 921-0110
(212) 888-3333
(212) 864-0500
(212) 243-7770
(212) 864-8862
(212) 964-6666
(315) 446-6502
(315) 769-9971
(516) 775-4700

Computerland/Nassau County
Computer Concepts
Computer Microsystems
Computer Shoppe
Data Scan Comp. Sys.
Future Visions Computer
Harrison Radio
Heathkit Electrs.
L.I. Computer Store
Programs Unlimited
Spartan Electrs
Syosset Video & Electrs.
Adirondak Electrs.
Castle Computers
Computer Room
Future Distribution
Computerland/Ithaca
Computer Tree
Computerland/Buffalo
Computer Resource
Computer Store-Rochester
Home Computer Ctr.
Micro Age Computer Store
Readout Computers
Summit Dist.
Computer Corner
Computer Store
Heathkit
Mr. Computer
Programs Unlimited

NORTH CAROLINA

Byte Shop
Computer Alternatives
Computerroom
Book Nook
K & S Newstand
Liberty News & Beverage
Worldwide News & Specialties

(704) 568-8100
(704) 274-5404
(704) 377-9821
(919) 725-3696
(919) 724-7537
(919) 493-1180
(919) 467-7130

NORTH DAKOTA

Computerland/Fargo

(701) 237-3069

Computerland/Grand Forks

(701) 746-0491

OHIO

All Media Material
American Bookstore, New Parma
Basic Computer Shop
Computer Corner
Computerland/Akron-Canton
Computerland/Cleveland
Computerland/Warren

(216) 678-5499
(216) 888-8210
(216) 867-0808
(216) 473-5010
(216) 493-7786
(216) 461-1200
(216) 544-4191

OKLAHOMA

Cosmic Comics
Hudson Computer
News Depot
Newstand
Abacus II
Computer Connection
Leo's Book & Wine Shop
Cincinnati Computer Store
Micro Computer Ctr.
News - Readers
Wilkie News
Micro Age Computer Store
Micro Center

(216) 784-3449
(216) 653-9010
(216) 454-4444
(216) 235-9321
(419) 865-1009
(419) 222-6464
(419) 255-5506
(513) 671-6440
(513) 435-9355
(513) 879-4444
(513) 223-2541
(614) 668-1550
(614) 486-5381

OKLAHOMA

Book Shack
Computerland/Oklahoma
Computer Service Unlimited
Computer Works
Employee's Assoc. Bookstore
High Technology Detail
Micro Age Computer
Computerland/Tulsa
Computer Store

(405) 233-1588
(405) 755-5200
(405) 329-2154
(405) 624-5276
(405) 686-4295
(405) 528-8008
(405) 728-1837
(918) 481-0332
(918) 224-5347

OREGON

Byte Shop
Computerland/Portland
Computer Solutions
Computer Specialties
Computer Store Corvallis
C 2 E
Fifth Avenue News
Micro Age Computer Store
New Day Computing
Norvac Electrs.
Rich Cigar Store

(503) 644-2686
(503) 620-6170
(503) 689-9677
(503) 399-0534
(503) 754-0811
(503) 245-9785
(503) 222-7462
(503) 256-4713
(503) 223-8033
(503) 644-1025
(503) 228-1700

PENNSYLVANIA

Computer Forum
Computerland/Dresler
Computerland/Lehigh Valley
Computerland/Paoli
Computer Store
Drexel University Book Store
Heathkit Electr. Ctr.
Heathkit Electr. Ctr.
Marketline Sys.
Mighty Byte Computer Ctr.
20 20 Computers
Computer House
Computer Workshope
Erie Computer Co.
Pittsburgh Computer Store
A & B Computers
Computer Store
Computerland/Harrisburg

(215) 296-3474
(215) 542-8835
(215) 776-0202
(215) 296-0210
(215) 322-5947
(215) 895-2000
(215) 288-0180
(215) 647-5555
(215) 947-6670
(215) 443-9020
(215) 489-1800
(412) 921-1333
(412) 823-6722
(412) 454-7652
(412) 391-8050
(717) 822-7727
(717) 272-0294
(814) 533-6892

RHODE ISLAND

Computerland
Computer City
Computer Power
Computer Store
Datamart/S. Carolina
Gismo Comm

(401) 274-5100
(401) 331-2187
(401) 738-4477
(401) 272-8770
(803) 233-5753
(803) 366-7157

SOUTH CAROLINA

Computerland
Computerland/Casper

(307) 634-9552
(307) 234-2879

CANADA

Galatica Computers
Micron Dist.
Lichtman's News
Computer Circuit
Computer World
Conte Electrs.

(403) 424-7007
(416) 361-0609
(416) 961-1466
(510) 672-9370
(604) 732-1485
(604) 324-0505

Computerland
Computerland/Rapid City
TENNESSEE
Chatanooga Computer Ctr.
Computerland
Computerland/Knoxville
Eastern Micro Computer
Rush Elects.
Computer Lab
Computerland/Memphis
Tobacco Corner

(605) 338-5263
(605) 348-5384
(615) 892-7038
(615) 246-6173
(615) 693-8225
(615) 594-8365
(615) 764-0831
(901) 761-4743
(901) 767-0233
(901) 682-3326

TEXAS

Compushop
Computerland
Computerland/Tyler
Computer Video Sys.
Heathkit Electrs. Ctr.
Percom
Micro Store
Software Concepts
Computerland
Computerland/Austin
Computer 'N' Things
Computer Shop
Computer Solutions
Computer To-Go
Expensive Toys/Big Boys
Heathkit
Micro Age Computer Store
City Electr. Supply
Compushop
Computer Center/Houston
Computercraft
Computerland/Houston Bay
Computerland/Westwood
Computer Technique
Lone Star News
Micro Age Computer Store
Micro Age Computer Store
Northwest Newstand
Waghalter Books
Westheimer Newstand
Young Electrs.
Agrilex Computers
Centurion Computers
Computer Port
Computer Pro
Software & Peripherals Ltd.
Waco Comm.
Computer Tech Assoc.

(214) 234-3412
(214) 363-2223
(214) 581-7000
(214) 423-3654
(214) 826-4053
(214) 272-3421
(214) 231-1096
(214) 458-0330
(512) 724-1551
(512) 452-5701
(512) 453-5970
(512) 828-0553
(512) 341-8851
(512) 472-8926
(512) 340-5600
(512) 341-8876
(602) 894-9247
(713) 621-1060
(713) 893-2060
(713) 527-8008
(713) 977-0664
(713) 488-8153
(713) 270-1200
(713) 947-9633
(713) 981-0288
(713) 270-9647
(713) 440-7547
(713) 681-7310
(713) 627-9970
(713) 781-7793
(713) 693-8080
(806) 797-4495
(817) 778-9105
(817) 469-1502
(817) 654-3360
(817) 566-3888
(817) 772-8550
(915) 533-2108

UTAH

Central Utah Electrs.

(801) 373-7522

Computerland/Salt Lake

(801) 364-4416

Quality Technology

(801) 521-5040

VERMONT

Kennedy Sys

(802) 626-8457

VIRGINIA

Computer Store
Arlington Electric Wholesale
Computerland/Tysons Corner
Computer Place
Computers Plus
H.B. Computer Ctr.
Heathkit Electrs.
Home Computer Ctr.
Program Store
Virginia Micro Sys.
V.P.I. Facilities
Computerland/Richmond
Home Computer Ctr.

(617) 272-0294
(703) 524-2412
(703) 893-0424
(703) 982-3661
(703) 971-1996
(703) 295-1975
(703) 765-5515
(703) 595-1955
(703) 536-5404
(703) 491-6502
(703) 961-5991
(804) 741-3536
(804) 340-1977

WASHINGTON

A B C Comm.
Amateur Radio Supply Co.
Byte Shop
Central Computers
City News
Computerland
Computer & Video Ctr.
Data-Borne Computers
Empire Electrs.
Heathkit
Heathkit
Mentor Personal Comp.
Western Micro Computer Ctr.
Alpha Computer Sys.
Personal Computers
Rob Roy Computer Shop

(206) 364-8300
(206) 767-3222
(206) 622-7196
(206) 746-5227
(206) 455-9683
(206) 581-0388
(206) 695-1540
(206) 248-0101
(206) 244-5200
(206) 682-2172
(206) 246-5357
(206) 527-0909
(206) 676-9558
(509) 586-7603
(509) 534-3955
(509) 575-7704

WISCONSIN

Byte Shop/Milwaukee
Chester Electr. Supply
Computers Unlimited
Computerworld
Digital Den
Four J's
American Computer Sys.
Century Computer
Computerland/LaCrosse
Computerland/Madison

(414) 281-7004
(414) 658-4616
(414) 355-5206
(414) 733-9547
(414) 476-6020
(414) 468-8990
(608) 257-1348
(608) 788-2350
(608) 781-2090
(608) 273-2020

WEST VIRGINIA

Computerland/Parkersburg
Computer Store
Nicks News
WYOMING
Computerland
Computerland/Casper

(304) 485-6823
(304) 345-1360
(304) 697-2459
(307) 634-9552
(307) 234-2879

NEXT IN PERSONAL COMPUTING

Personal computing
in personnel
management

Personal computing
estimates costs

Personal computing
on the high seas

Special report:
Communications
products

PERSONAL COMPUTING

Sales Administrator
Joy Nichols

Sales Coordinator
Anne Lacitignola

Associate Publisher
Jeff Weiner

District Managers
Ferris Ferdon (214) 231-0523
William Knickel (408) 736-6667
Robert Pavone (201) 843-0550
Donna Quinn (408) 736-6667
Michael Reynolds (213) 641-6544
Arlene Schulman (201) 843-0550

Japan
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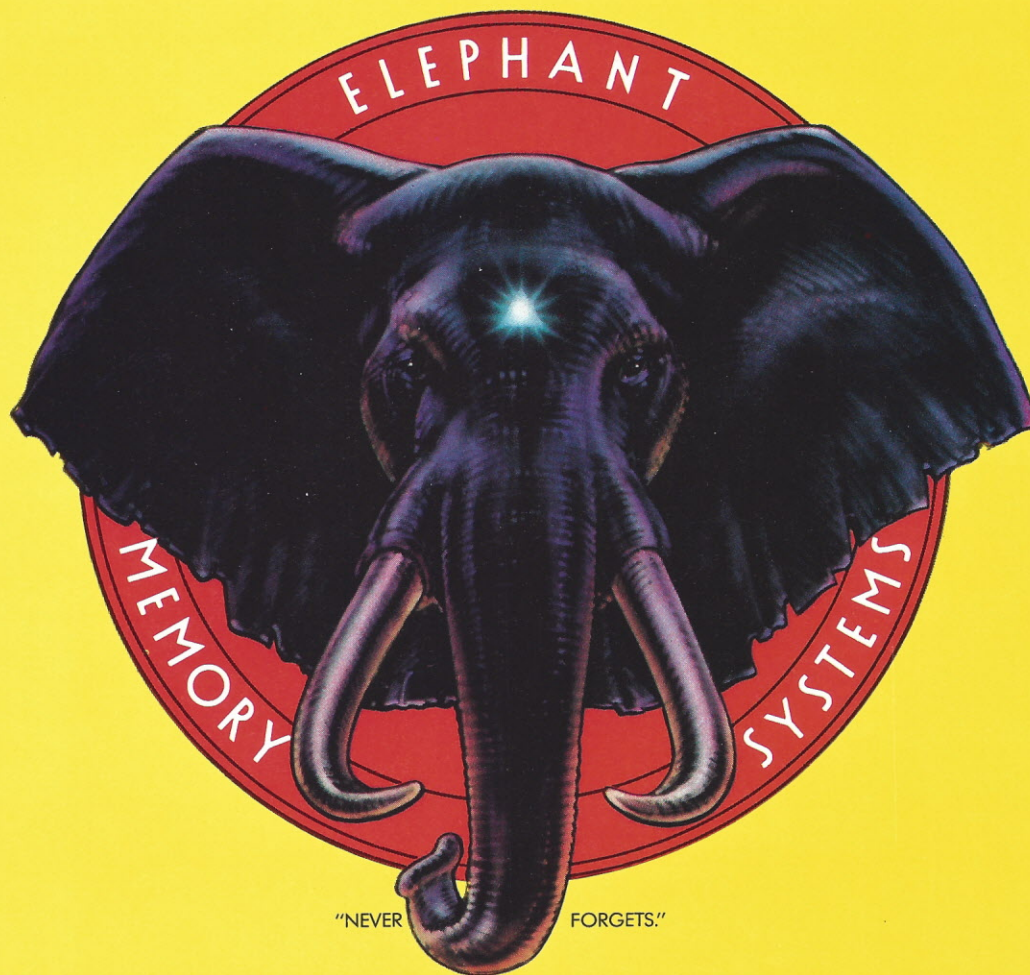
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